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Notes on Foreign Metallurgy.

STUDIES ON THE BLAST-FURNACE.—L. GRUNER, in *Annales des Mines*, arrives at the following conclusions: 1st. The production of large blast-furnaces, whose contents exceed 200 cubic metres, does not increase proportionally to their capacities. 2d. In order to estimate the working of furnaces it is necessary to determine experimentally the proportion CO : CO_2 in the tunnel-head gases; by means of this proportion it is not only possible to calculate the true composition of the gas, but also the quantity of air demanded by the furnace. 3d. In order to determine the proportion CO : CO_2 it is not sufficient to take a number of samples instantaneously, but the gases must be withdrawn for several hours. 4th. When the composition of the gas is once determined, it is necessary, in order to keep an exact account of the working of the furnace, to ascertain the balance between the heat received and that expended, and to estimate separately the heat evolved in the zone of the tuyeres and that produced in the reducing zone. 5th. On applying these principles to some of the Cleveland blast-furnaces, it is possible to prove that the advantages of high furnaces over low ones simply result from the lower temperature of the upper portions of the shaft. The reduction takes place in a more complete manner by the sole action of carbonic oxide, without the intervention of solid carbon; thus approaching the ideal working of a furnace, which supposes the solid carbon to be exclusively burnt by the oxygen of the blast. A subordinate advantage is the less amount of sensible heat possessed by the gases at the furnace-top. 6th. The consumption of fuel in blast-furnaces is partly dependent on their production. A minimum consumption corresponds to the average working, which varies with the height and absolute capacity of the furnaces. 7th. In consequence of the decomposition of carbonic oxide in the upper portions of blast-furnaces, the temperature of the tunnel-head gases cannot be lowered beyond a certain limit; therefore, when this limit is attained, there is no advantage in increasing the volume and height of furnaces. Too slow a working and an excessive volume may become burdensome. 8th. The heat supplied by the hot-blast may advantageously replace that produced by combustion in the tuyere-zone. The economy due to the hot-blast diminishes relatively as the temperature is advantageously elevated. In practice the actual economy is small above 700°–800° C. The hot-blast tends to increase the value of the proportion CO_2 : CO; and, in consequence of the cooling of the upper portions of the blast-furnace, promotes the reduction without consumption of solid carbon, *i.e.*, the ideal working of the furnace. GRUNER then proceeds to show, by means of examples, how the working of the furnace may be ascertained *without chemical analysis.*

ARSENIC IN PIG-IRON.—J. MITTEREGGER, in *Zeitschrift d. Berg- und Hüttenmännischen Vereins für Kärnten.*—The author gives the analyses of the following irons, which are remarkable as containing arsenic: 1, is a light-gray iron; 2, white iron containing graphitic spangles; 3, white fibrous iron.

	1.	2.	3.
Graphite	1·300	8·800	0·550
Comb. carbon	0·955	1·555	1·925
Silicon	0·648	0·576	0·192
Phosphorus	0·440	0·015	0 041
Arsenic	1·012	1·290	1·698
Manganese	0·722	0·759	2·020
Copper	0·133	0·029	0·119
Calcium	——	0·050	0 075

The arsenic is almost proportional to the combined carbon, while the silicon is inversely to the former. The only other account of arsenic in carbonized iron is in PERCY'S *Metallurgy*, where the presence of arsenic in cannon-balls from Sinope and Algiers is mentioned.

CONTRIBUTIONS TO THE ANALYSIS OF PIG IRON AND STEEL.—DR. F. KESSLER. *in Fresenius's Zeitschrift für Analytische Chemie.*—The author claims the importance of a direct determination of iron in cast iron and steel, not only for controlling in a complete analysis the sum of the other constituents, but also for the value it affords of judging of the percentage of these constituents in a partial analysis. In order to accomplish this he determines the iron volumetrically, but in a way which he says is free from the defects of those ordinarily employed. The solution of iron in hydrochloric acid, freed from silica, copper, and compounds of carbon, is deoxidized by means of stannous chloride, and the excess of the latter destroyed by adding mercuric chloride. Without filtering these the diluted solution is titered with a standard solution of potassium bichromate, until the turn-bull-blue reaction disappears, when about one cubic centimetre more of the chromic acid solution is added and the whole titered back with a standardized solution of ferrous chloride until the blue appears. The analyses cited are very satisfactory. The potassium bichromate solution is prepared by dissolving 4·91 grms. of the pure and carefully fused salt in the litre. The author also advises the volumetric determination of manganese. This is accomplished by precipitating a biniodide with the help of bromine; dissolving the washed precipitate in antimonious chloride and hydrochloric acid, and titering the excess of the latter with potassium permanganate; these two latter solutions must of course be standardized.—*F. P. in Am. Chemist.*

Rock Drilling—An Experiment.

A correspondent of the *Railroad Gazette* sends that paper the following account of an experiment with a new rock drill:

I happened to be at the tunnel on Fourth avenue and Ninety-second street last Saturday, when Professor Wood, of the Stevens' Institute of Technology, was about to try a small drill of his invention in one of the headings, and went in to see it.

Just as the whistle blew for noon, one man took up from the bottom of the tunnel a column of peculiar construction, and carried it to the heading, and, by the aid of another man, soon set it in place. They then returned and took the machine, and mounted it on the column. They then made connection with the air-pipe. They were directed to make a hole in the roof, inclining it upwards at an angle of ten or fifteen degrees. The men were very deliberate and probably consumed twenty or twenty-five minutes in making these preparations. They then drilled a hole thirty-six inches deep, when the whistle blew for one o'clock. At this time they were directed to leave, as they were about to make a blast. In just nine minutes they had removed all their machinery and disconnected all their hose. The thing which struck me most forcibly was not the rapid drilling, but the extreme portability of the apparatus. The column and clamps weighed about 80 or 100 pounds. The drilling machine weighs 150 pounds, and is about two feet long. The steel used was one and one-eighth inches diameter, and the bit was two inches diameter. Professor Wood informed me that he intends to run the south heading with these portable drills, an arrangement with the Superintendent, Mr. BRINKNELL, having already been made for this purpose.

Vieille Montagne.

The history of this mining company, which is such a bugbear to American zinc smelters, for 1872, is as follows: In the course of the year, 63,528 tons of rough minerals of every description were obtained from the mines of the Vieille Montagne Zinc Company; 78,968 tons of minerals were purchased in a rough and calcined state; and 3,967 tons of argentiferous lead minerals were produced from the mines of the company. Continuing our review of the operations of the Vieille Montagne last year, we may note that in 1872 some 94,626 tons of coal were extracted from the mines of the company, 39,663 tons of rough zinc were produced in the various works of the company, 6,851 tons of zinc white, and 33,491 tons of rolled zinc, while 45,458 tons of zinc of every description were sold by the undertaking. At the close of 1872, the Vieille Montagne employed 7,187 work-people, representing with their families 21,498 persons.

THE first span of the International Bridge over the Niagara River, near Buffalo, was completed June 9, and the false works for the next span have been put in position. The crib or coffer dam for the last pier was safely moored in position June 12, and GZOWSKI & Co., the contractors, are pushing forward the work on the pier as fast as possible. The approaches to the bridge for the Great Western and Canada Southern roads, at the Canada end of the bridge, are already being constructed.

MINING DEPOSITS AND PATENTS.—Commissioner Drummond, of the General Land Office, has decided that lands valuable on account of deposits of carbonate of soda, nitrate of soda, sulphur, alum and salt, may be patented under the Mining Act of May 10th, 1872, as well as other valuable mineral deposits, except those specially reserved by Act of Congress.

Mineralogical Notes on Utah, California and Nevada, with a Description of Priceite, a New Borate of Lime.

The American Journal of Science and Arts for August will contain an article by Prof. SILLIMAN on certain minerals found in the Western mining regions which we take the liberty of copying entire.

1. *Enargite*, $3Cu\,S + As^2Sb^2$. This hitherto rare mineral exists in two or three localities in a district of Southern Utah, known as the Tintic District, about eighty miles south of Salt Lake City. The localities are (1) the Shoebridge Mine, (2) the Mammoth vein, Eureka Hill, East Tintic, and (3) the Dragon Mine, East Tintic. All these localities occur in metamorphic crystalline rock of the granitic family.

The Shoebridge locality furnishes finely crystallized specimens, associated with octahedral pyrite. The vein in which it is found fills a fissure about four feet wide in granite rocks. This vertical fissure is filled to the depth of about 80 feet from surface with enargite mixed with pyrite. The whole mass is regarded as a silver ore. A sample of the ore made up from such stock as I had in my hand yielded to fire assay 269·25 oz. troy of silver, or $347.34 to the ton of 2,000 lb.; this is equal to 0·841 per cent. of silver, which is considerably above the average value of the vein. Below the depth of 80 feet, the character of the vein changes, as I am informed by one of the owners, Mr. SAMUEL T. HATCH, of Salt Lake City, to a vein of argentiferous galena, carrying some antimony. In examining many hundred pounds of the ore taken from above the galena zone, I found only enargite and pyrite with quartz and some heavy spar as a gangue—and not a trace of galena, as the analysis proves.

The enargite from Shoebridge mine cannot be distinguished by the eye from that which was first mentioned by the late Prof. ROOT, from the "Morning Star Mine" in Alpine County, California (this Journal, II. xlvi., 201).* It occurs both massive of a brilliant luster and fracture, resembling in color gray copper and also in brilliant orthorhombic crystals striated on the terminal planes parallel to the longer diagonal. The crystals are sometimes 5 or 6mm long, but more commonly are not over 2mm in length. The forms are more simple than the crystals figured from Peru. Dr. GIDEON E. MOORE, who has studied those from the Morning Star Mine, informs me that their form is identical with the Shoebridge mineral, and is expressed by the crystallographic formula $\infty P.\ 0P.\ \infty\breve{P}\infty.\ \infty\breve{P}\infty$.

Its pyrognostic characters conform to those of the Peruvian mineral, but it contains much less antimony than the California variety. Its specific gravity is 4·861, in fragments, to 5.111 solid—almost that of pyrite, and somewhat higher than the Peruvian variety. Mr. E. S. DANA kindly furnished me some time ago the following approximate analysis of the Shoebridge mineral made by the chlorine method upon carefully selected crystals, He obtained—

Sulphur	34·35	Iron	1·06
Antimony	·95	Zinc	*trace*
Arsenic	17·20	Residue (undissolved),	*trace*
Copper	46·94		
			100·50

The silver was not determined. The iron is probably due to the pyrite, with which the species enargite is intimately associated; this occasions also the excess of sulphur in the analysis, which corresponds, however, sufficiently well with the formula given above.

At the "Mammoth Vein," in Eureka Hill, the enargite occurs in broad laminated masses, somwhat resembling black hornblende, and stained green in the joints by the oxidation of a portion of the copper. It is associated with calcite and is quite free from pyrite. The blowpipe shows it to be free, or nearly so, from antimony. This locality has not furnished the enargite otherwise than in columnar and cleavable masses.

The mineral from Dragon Mine resembles the last named variety, but is more massive. Neither of the two latter varieties have been analyzed.

2. *Bismuthinite*, B^2S^3.—This species is found rather abundantly in three associated mineral veins in Granite Mining District, Beaver County, Utah, about ten miles west of Beaver City. The main vein, which is said to be about six feet in thickness, contains also bismuth ocher or *bismite*, $\ddot{B}i$, staining the surface greenish yellow (a sign by which the vein has been traced at intervals, it is said for about 2,000 feet), and *bismutite* (hydrous carbonate of bismuth), $\ddot{B}i^4\dot{C}3\dot{H}^4$, in yellowish-gray masses inclining to siskin green. These last two species are due, no doubt, to the oxidation of the bismuthinite.

These three species sometimes form masses of considerable size, but more commonly the sulphid occurs alone in a gangue of almadin garnet of a hair-brown color, with black hornblende, heavy spar and quartz. Yellow pyrite exists in small quantity in the gangue, and by its oxidation has furnished masses of iron oxides. No arsenical ores could be detected in the samples which have fallen under my observation, nor does the blowpipe detect either lead, antimony, or copper.

Hitherto bismuthinite has been a rare species in North America, and I do not know that it has been found in quantity likely to give it a commercial value.† In the Beaver vein, the metal is said to form about five per cent. of the mass.

When this locality is properly opened for mining we may hope to obtain an abundance of good mineralogical specimens of these several species. I am indebted to Mr. J. B. MEADER, of Salt Lake, and to Col. HEAD of San Francisco, for the specimens from Beaver, which I have examined.

3. *Wulfenite*.—In a former communication (this Journ., III., iii., 195) I pointed out the absence, so far as observed, of phosphates among the mineral species found in the Wahsatch Range, and the existence of molybdic acid as wulfenite in its place. Further observation has confirmed this statement. In a subsequent visit to that region, and more recently, I have received from Major WILKES, of Salt Lake City, wulfenite from the Empire mine, Lucin District, Box-Elder County, Utah, in the Wahsatch Range, which for beauty is rarely equalled by the same species from any known locality. The crystals are thin tables 20 to 30mm broad, of pure yellow color set on deep brown iron ochre, and making splendid cabinet specimens.

4. *Orpiment and Realgar*.—These two species are found with galenite in a vein known as the "Lucky Boy mine," in Butterfield Cañon, which is in the Oquirrh Range on the west side of Jordan Valley, Utah.

5. *Priceite*.—This borate of lime, which I received from Mr. THOMAS PRICE, in San Francisco, in March, 1872, has been noticed by Mr. CHASE, and its mode of occurrence and probable origin described by him in this Journal (III., v., 287), accompanied by two analyses. A recent examination of this mineral—of the soft chalky variety—affords the following results. Its specific gravity is 2·262 to 2·298. It resembles chalk, but is even softer than that mineral. Its powder, under a half inch magnifying power, is seen to consist exclusively of minute rhombic crystals. It is insoluble in water which removes only a very minute quantity of common salt, not a constituent of the mineral. It dissolves completely in dilute hydrochloric acid, and this solution promptly deposits abundant crystals of boric acid. Its filtrate is completely free of sulphates, and reacts only for lime, with a trace of iron and alumina. In the close tube it evolves abundant neutral water, and at a red heat fuses to a white enamel. The spectroscope discloses from its solution in hydrochloric acid only the double spectrum of boric acid, with the lines of calcium and sodium. It contains no carbonate of lime, which might very naturally be looked for. Five grams of the air-dried mineral afforded me by the volumetric method only 0·7 c.c. of CO_2, equivalent to 1-25,000 of calcium carbonate in the weight taken—hardly a trace.

Its water of constitution is very constant—and it is almost non-hygroscopic. Two determinations of the water in the air-dried mineral gave 18·395 and 18·40 per cent. of water, while two of the same dried at 212° gave each 18·29 per cent.

Dried at 212°, three analyses made by hydrofluoric acid—which leaves the boric acid to be determined by the loss—gave as follows:

	1.	2.	3.	Mean.	Oxygen ratio.
Water	18·29	18·29	18·29	18·29	1.8
Lime	32·38	31·37	31·73	31·83	1
Na Cl. $\ddot{F}e\,\ddot{A}l$	·93	1·00	·97	·96	
Boric acid	48·50	49·34	50·01	49·00	3·7

The oxygen ratio gives approximately $4\ddot{B}$, $3\dot{C}a$, $6\dot{H}$; the lime is a little too high. The probable formula of the mineral is $\dot{C}a^3\ddot{B}^4\dot{6}\dot{H}$, which makes the mineral to differ from hydroboracite by containing one-third less water and no magnesia. This formula requires: water 19·43, lime 30·21, boric acid 59·36=100.

This mineral is certainly different from the cryptomorphite of How, to which it has been provisionally referred by PRICE and others. It has the microscopic crystallization described by Dr. ROBB as belonging to the Nova Scotia species; but the absence of soda and the greater ratio of the protoxide base carries it much nearer to the hydroboracite, from which it is separated by containing no magnesia and less water. It is certainly not a mechanical mixture, as its finely divided condition might seem to indicate. The microscope completely sustains the constant results of analysis on this point. As it appears therefore to be a new species, I would propose for it the name *priceite*, in honor of Mr. THOMAS PRICE, the well-known metallurgist of San Francisco. Mammillary and radiate masses of aragonite, some of great size, but more frequently as crusts, occur with the priceite, and were at first mistaken by the miners for a variety of this borate of lime.

(TO BE CONTINUED.)

* Wrongly quoted in Dana (5th ed.) p. 797, as in vol. xlv.

† I have observed it in minute prismatic crystals in the well-known chrysoberyl ocality of Haddam, Conn.

The Vienna Exposition.

COPY OF ENGINEER'S REPORT—U. S. DEPARTMENT OF MACHINERY, VIENNA EXPOSISION.

JUNE 8, 1873.

TO THE UNITED STATES CHIEF COMMISSIONER, VIENNA EXPOSITION:

Commencing our work in connection with this exhibition as we did, after every other nation had all their preliminary arrangements made, it was expected that we should be somewhat late in making the final preparations for exhibiting our machinery, especially so, when it is remembered that as late as November last, our manufacturers had not thought favorably of sending their goods at all; and when we consider that not until as late as the 14th of February of *this year* did our Congress finally pass the appropriation on which depended our coming as a nation, we need not to-day feel ashamed of our Machinery Department, though still incomplete. I had confidently hoped in this report to be able to state that we were now in satisfactory running order; this is still impossible—owing to circumstances over which we have no control. Our American Boiler, borrowed for use by PITKIN BROTHERS, of Hartford, (which, when being tested, was pronounced by the authorities the only one on exhibition that stood the test without breaking,) is now complete, and we have steam up daily. Our four American engines (also loaned for use) are in place, and our part of the steam connections made; but the main steam pipes (furnished by the Imperial Commission) are not yet complete. I have now good reasons for thinking they will be furnished within forty-eight hours. Taking into account the many adverse cir-

cumstances to which our section has been subjected, early and late, I feel free to say that every American who fairly considers this feature of it, will feel pride in showing to the world the amount and quality of materials brought together in so short a space of time.

The chief manager, in the circulars to the foreign commissioners, required that they should send to him, during the month of August, 1872, the length of shafting required by the respective nations, wherewith to operate their machinery. This request was, I believe, complied with by every nation except the United States. The possibility of our complying at that date with this request may be judged by the fact that not until November did our commission receive the first application from a would-be exhibitor of machinery, and, as late as the first of December, it was not known that we should require a foot of shafting or a square meter of space, and yet to-day, not only is our space in the Machinery Hall filled, but of the 27,000 square feet of space in the covered court, fully two-thirds is occupied by machines and products legitimately belonging in the Machinery Hall. Considering all in all, the tardy action of our Congress, the late date at which it was decided that we should come, the great distance our products had to be brought, the fact that those products were brought by sailing vessels, (in this age of steam,) the fact that the Austrian patent laws repel, rather than invite, inventors to exhibit the products of the mind—all these and other facts considered—we are safe in asserting that we have had more difficulties to contend with than any other nation represented in this exposition, and if we come out of this international competition as we have from previous ones, the United States will have done what no other nation could do under the same circumstances. With much vacant space, caused by applicants to whom it was alloted withdrawing without notifying the commission, and with much of our machinery, as yet, covered from view, and none of it as yet operated, our department is already a point of interest and attraction to those well versed in the peculiarities of American machinery, and, judging from what is to be seen in other sections, I can say that we shall have as attractive a machine exhibit as may be found under the half-mile length of roof covering the hall—not merely attractive to the casual observer, or the curiously inclined, not only to the business man, and those studying the advancing strides made by our inventors and thinkers, but our machine department will have its attractions for governments themselves. Those peaceably inclined may find in our Agricultural Hall the implements of peace in plenty, while those inclined for war may find our Remingtons, our Colts, our Smith & Westons, and our Peabodys, ready and willing to supply the needful articles to make themselves successful warriors ; or if they wish, as many now do, to manufacture for themselves, we can supply them with machine tools that will make either sewing machines or rifles, pruning hooks or spears.

The restless American spirit already shows itself, with the best wishes for the success of the American section, and, in some cases, without thinking of the many difficulties now, or to be, overcome, he wants to know why this and that are not different from what they are, or why such and such a thing has not already been done ; the most impatient people in the world should just now be the most patient. In one month more, when we are in good running order, and comparisons are being made, and it is considered that we, with three months' notice, are competing with nations who have been preparing for this exposition for twelve months past ; and, when the juries shall have examined, compared and made known their decision, and it is found that the United States, as usual, is ahead in its proportion of prizes, then we shall feel better, and think that, after all, we need not regret coming to the Vienna Exposition.

Very respectfully, T. R. PICKERING,
Engineer U. S. Dept. of Machinery.

Engineering and Mechanical Notes.

THE English railways, out of a traffic of 375,000,000 passengers, kill about 900 persons a year, besides railway servants and suicides. This seems a large item to the debit of the "advance of civilization," but let us imagine, or attempt to imagine the loss of life that would necessarily take place if the same number of people were to be transported by the old means ; with the fact for a basis, that in London 122 persons are killed annually by street accidents.

A special department of considerable interest at the Vienna Exhibition is that devoted to a collection of appliances for the care and transport of the sick and wounded during war, an important section of the exhibits being those showing the adaptation of railway rolling stock to hospital purposes. Among other arrangements is a hospital train composed of ambulances for the wounded, sick, convalescent, etc., kitchen and office cars. The gaps in the plank walk placed lengthwise the cars, as is customary in Europe, are bridged over by flaps which fall down and bridge over the spaces between the carriages, thus connecting the adjacent galleries. At the center of the kitchen carriage, on one side, is a well-arranged cooking stove, and opposite a table provided with scales and weights and other suitable appliances. In convenient cupboards are stored the cooking utensils, and an ample collection of plates, dishes, glasses, etc., while there is storage for wood and coal, a good-sized water tank, and conveniences for washing-up plates, etc. Each end gallery also carries an ice safe. The chimney of the stove is formed of double pipes, the space between the two pipes not only protecting the woodwork from the heat of the internal flue, but also serving as a ventilating shaft, the air being admitted to it by openings.

The traffic over the Dunleith and Dubuque bridge, across the Mississippi, in 1872, by the Illinois Central railroad, was 456,100,000 pounds of freight (331,360,300 pounds eastward and 124,739,700 pounds westward bound), and 52,324 passengers, being an increase of 6,960,300 pounds of freight and 2,306 passengers. As this company paid $141,289 out of the $161,070 which was collected as tolls, we presume the total amount passed over was about one-seventh more than the above.

The specific gravity of the South Staffordshire coal is stated to be about 1·3, so that a cubic yard should weigh 2,190·24 lb., or nearly the statute ton of 2,242 lb. Hence, inclusive of the layers (termed partings), an acre of the "thick" or "ten-yard" coal should contain something less than 48,400 tons, and an acre of the same coal eight yards in thickness somewhat less than 38,720, say 38,000 tons.

A journal published in the department of the Nord announces that the Denain Forges and Blast Furnaces Company, France, has commenced the erection of steelworks in that neighborhood ; the plans will involve an outlay of $600,000—$800,000, and the works are to be completed by next May. The new establishment has already received orders in advance to the estimated amount of $400,000, and the Northern of France Railway Company has taken a large interest in it, so as to assure the production of its rails.

According to the Denver (Col.) *News*, a company of capitalists are considering the practicability of tunnelling the Rocky Mountains near their base. The idea is to tunnel the mountains from a point about one mile below Black Hawk to the Middle Park, running in a north-westerly direction. The tunnel to be run will, it is presumed, cut many rich veins of gold and silver, and thus a great mining interest be developed. Money for the prosecution of the work has been subscribed, chiefly by English capitalists, who are sanguine of the ultimate success of the enterprise. The tunnel, when completed, will be 12 miles in length. It is intended to make it large enough to be used for railroad purposes, and so, if a railroad is ever to be constructed to the Middle Park, it will find its most convenient route through the tunnel. It will be called the Sierra Madre Tunnel, and the incorporation papers for its organization have already been filed. GEORGE W. HEATON, a gentleman well versed in matters of this kind, will have business charge of the operations of the company.

ACCORDING to *Harper's Weekly*, the United States Signal Corps has recently extended its series of observations to include a daily record of the surface and bottom temperature of the rivers and harbors on which its several stations are situated. These observations are not only of interest in a meteorological point of view, but they are also of great practical importance in connection with the introduction of useful food-fishes into the rivers and lakes of the United States, a work which is now being energetically pushed forward under the supervision of Professor BAIRD, the United States Commissioner.

It is well known that the possibility of introducing salmon into any given stream will depend upon the relationship of its temperature during the summer and autumn to the particular species ; some kinds, as the true salmon of the North Atlantic (*Salmo salar*), requiring a summer minimum of at least sixty to sixty-five degrees, while others will bear a higher temperature.

The Signal Office has also recently established the regular publication of a weekly weather-chronicle, which will doubtless prove of great interest to meteorologists.

Products of the Destructive Distillation of Lignite.

BY B. NIEDERSTADT.

THE lignites examined came from the Rhenish-Hessian basin. 1. Lignite from Meissner, of a red-brown color and woody texture ; spec. gravity 1·12. 2. Lignite from Rheinhardswalde, grey or black, containing abundance of resin ; spec. gravity 1·13. 3. Brilliant lignite of Meissner, black, fracture fibrous, lustre vitreous ; spec. gravity 1·32. 4. Lignite of Hirschberg, brownish-black, in tree-like masses ; spec. gravity 1·35. The following is their elementary composition :

	1	2	3	4
Carbon	51·238	58·782	69·995	60·302
Hydrogen	4·169	4·042	3·192	4·859
Oxygen	32·326	20·803	17·591	20·169
Nitrogen	0·175	0·150	0·123	0·121
Ash	0·795	5·940	5·470	3·167
Moisture	10·297	10·283	3·629	11·391

On distillation these lignites yield solid, liquid, and gaseous products ; at a dark-red heat, a brown tarry matter passes over along with combustible gases. To separate the watery portion from the tar, common salt is added to the mixture, heated to 40°. The quantity of tar, when fed from water, amounts to 4 to 5 per cent., and the watery products 48 to 55 per cent., containing acetic acid and ammonia. The oily matters distil over at 95° to 220°, leaving a black pitchy residue. The distillate, on agitation with concentrated soda-lye, yields phenol. On fractional distillation, the portions passing over up to 150°, contain pyrrol and picoline, which boils at 135°, and is distinguished from aniline by not giving a violet coloration with chloride of lime. The part passing over about 220° solidified on cooling, yielding a crystalline mass soluble in alcohol and ether. It melts at 49° to 51°, and is a paraffin formed of hydrocarbons $C^n H^{2n}$. It amounts to 1 per cent. of the lignite employed. The gaseous mixture, from the Meissner lignite, consists of : Hydrogen, 14·26 ; carbonic oxide, 40·12 ; marsh gas, 10·29 ; nitrogen, 4·09 ; carbonic acid, 2·10 ; ethylene and superior hydrocarbons, 2·13. There appears, consequently, little prospect of using the gases from lignite for lighting purposes.

Beton Coignet.

A DESCRIPTION OF THE WORKS OF THE NEW YORK AND LONG ISLAND COIGNET STONE COMPANY.

THE recent great fires, affecting not only those whose buildings have been destroyed, but the whole commercial interests of our country, have called attention to our building materials. The terrible explosion of granite, when subjected to intense heat, and the crumbling of marble, becoming converted into lime, have diminished our confidence in what were supposed to be our strongest and most enduring materials. It has been found that artificial materials withstand heat better than natural, as brick, having withstood the test of years, is now recognized as a good material, the thought of its being an artificial product not being considered.

One of the most valuable and useful reports of the Paris Exposition of 1867 is by Mr. Leonard C. Beckwith, Civil Engineer. The author gives a history of what is known in Europe as Beton Coignet, and a concise description of the processes and the results of experiments on its tensile and crushing strength. This material is applied in France to a great variety of uses. Palaces, private residences, churches, archways, reservoirs, sewers, water pipes, etc., are capable of being formed by a single piece of the greatest solidity—impervious to water, secure against the action of fire and frost, and capable of every variety of embellishment. As many of our readers may not be aware to what extent it is being used abroad, and the extensive use and demand that exists in this country, we give some extracts from the reports of Mr. Beckwith and Dr. Barnard, U. S. Commissioner to the Paris Exposition, and of General Q. A. Gilmore, who was sent to France by our Government, and whose report is published by authority of the Secretary of War.

It is now seventeen years since M. Coignet's beton was introduced into France. At first there was a great prejudice against it, and it was tried continually on minor structures. After two years of experiment, it was adopted by the French Government, and has since been used to a great extent. In Egypt it is largely used, and employed on a vast scale, especially for light-houses. In Paris there are more than forty miles of sewers constructed of this material. The arches under the Exposition building and on which it was built, and which constituted a perfect labyrinth, attracted great attention from all engineers, and were sufficient to satisfy the minds of the most sceptical. Aqueducts are now being constructed for the purpose of supplying water to Paris. The distance from Paris to the source of the Vanne is more than ninety-four miles, and in its course the line has to traverse a series of valleys and ravines, and to cross roads and railways, and the numerous requirements of the work have involved the formation of extensive bridges, aqueducts, syphons and tunnels. An immense reservoir will be completed, close to the park of Montsouris, and a large aqueduct upon arches has been made close to the old Roman aqueduct of Arcueil. The arches crossing the valley of Fontainebleau, a distance of about thirty-one miles, are the heaviest work of this great undertaking. Not only has the aqueduct been constructed of this material, but the tunnels also. The aqueduct is supported upon a series of arches extremely light, and rising to a height of fifty feet from the ground; the thickness of the arches at the crown is fifteen and three-fourths inches, and the spans from forty-two feet six inches to one hundred and twenty-six cubic feet. In Paris the embankment, on which runs the Avenue de l'Empereur at the Trocadero is supported, for a quarter of a mile, by a wall forty feet high. It has been found that Beton Coignet is admirably adapted for marine structures. The Suez Canal, the docks at Boulogne, and numberless structures of this kind bear witness to its strength and utility.

One of the important benefits to be derived from the use of beton is probably to be looked for in the superior strength and stability which it gives to all structures composed of it. The usual method employed in natural stone or brick and mortar, by a want of combination between two entirely dissimilar materials, with a great number of bonds and joints, prevents a perfect union of the various surfaces at the point of junction, and the result, of course, is unequal settling and cracking of the walls. Water also, washing away the mortar, leaves the separate blocks insecure. Walls of Beton Coignet are not liable to such accidents, the whole being one solid homogeneous block. Dr. Barnard, in his report as U. S. Commissioner, speaks of the utility of the Paris Exposition in being able to bring this new material for the first time before the world.

The following are extracts from reports by General Q. A. Gilmore: "This agglomerate possesses all the characteristics of durability as exhibited in natural stones, being close grained, hard, and homogeneous, differing in these respects from all other kinds of artificial stone, which have been introduced to popular notice. The soft and porous stones give way under climatic influence, in consequence of the alternations of heat and cold causing disintegration on the surface, which becomes serious in cold climates where the stones are exposed to the weather, and subjected to thawing and freezing. The proportions of the ingredients, and the peculiar method of manipulation, render the agglomerate exceedingly compact.

Careful chemical tests have shown Beton Coignet to be practically impervious to water. Two small specimens, weighing two and a half grammes, were tried by Dr. Walz, a New York analytical chemist. They were immersed in water fifteen minutes, and then kept four days in an atmosphere saturated with moisture. One of the specimens did not increase in weight during the interval, and the other absorbed 16-100 of one per cent., or 16-10,000 of its own weight. Beton Coignet will undoubtedly withstand the effect of frost or extreme northern climates, as well as natural brown stones, limestones, or granite of equal density. Its peculiar character adapts it to the demands of every department of engineering, architecture and sculpture, from the boldest edifices to the most delicate works of art. It has been employed in Europe, and may be applied with equal advantage in this country, for warehouses, private residences, docks, aqueducts, and sewers, for reservoirs, basins, cisterns, drains, and water pipes, and for work requiring elaborate ornamentation. It is the best artificial stone that has been brought into use, and there is no doubt that it possesses all the properties requisite for withstanding the alternations of heat and cold.

This material, like brick—which is also an artificial stone—is capable of bearing a greater heat than natural stone; and its adaptation for use in large masses, as the structure may be made much lighter with equal strength, as has been demonstrated by most extensive experiments in Paris, renders it, for many purposes, superior to natural stone.

The following table, taken from the report of Mr. Beckwith, shows the comparative strength of this material and of other substances employed for the same purpose:

CRUSHING STRENGTH IN LB., PER SQUARE INCH.

Mortar.	Brick.	Limestone.	Sandstone.	Beton Coig.
280 to 2100	550 to 1700	4000 to 5500	2200 to 5500	2634 to 7490

TENSILE STRENGTH IN LB., PER SQUARE INCH.

Mortar.	Brick.	Limestone.	Sandstone.	Beton Coig.
50 to 290	115 to 300	120 to 864	180 to 900	288 to 426

A cubic foot of Beton Coignet weighs about one hundred and forty-six pounds. Stone, much stronger than the specimens referred to in the above table, is now being made by the Coignet process, many samples having sustained a pressure of 12,000 pounds, or six tons to the square inch.

Since the above reports were made, a large factory has been built in Brooklyn, at the corner of Third avenue and Third street, which is now in working order, and employs a force of about fifty men. The company have also an elegant office, which is being erected as a specimen of their work. The new works are capable of turning out fronts for ten ordinary houses per day, besides a large quantity of fine ornamental work, and will give constant employment to an average number of a hundred workmen. The total area of ground is five acres. The factory building is of mammoth dimensions, covering a full acre of ground, and thirty-two feet in height. Among the machinery is a hydrostatic testing press, by which a crushing pressure of 120,000 pounds can be applied. The company can point to many proofs of the excellence of their work such as the pavement around the Worth Monument, in New York, the new Receiving Tomb at the Cemetery of the Evergreens, which will be a massive monolith, capable of holding five hundred bodies in its capacious catacombs and many other admirable specimens of construction.

Early American History.

Interesting relics of the early discovery of America occasionally turn up. At a late meeting of the Mexican Geographical Society, Mr. Bliss stated that some brass tablets had been lately discovered in the northern part of Brazil, and not far from the coast, which careful examination had shown were covered with Phœnician inscriptions telling of the discovery of America five centuries before Christ. The tablets had been acquired by the Museum of Rio Janeiro, with whose director he was personally acquainted, and that the connection of this gentleman with the discovery of the tablets was in itself a guarantee of the correctness of the report. The inscriptions—so far as yet deciphered—relate that from a port on the Red Sea a Sidonian fleet sailed, and following the east coast of Africa, doubled the Cape; thence following the African west coast, probably with the favoring south-east trades of the southern latitudes, until the north-east trades, preventing further progress northward, forced the prows of the vessels across the broad Atlantic. At any rate, according to Mr. Bliss, the tablets record the *fact* of the Phœnician fleet having reached the Americas five centuries before Christ, at some point now known as northern Brazil; that the tablets give the number of vessels, the number of the crews, the name of Sidon as their home, and indeed various very interesting particulars. Mr. Bliss has promised when he acquires further particulars to hand them to the society.

The British Meeting in Belgium.

Our foreign exchanges contain the programme of the meeting at Liege, Belgium, of the British Iron and Steel Institute. The meetings will mainly center at Liege, and the proceedings will commence on August 18th, when the Mayor of Liege will officially receive the Institute at the Hotel de Ville, after which addresses will be delivered in the University Hall by the president of the Institute and by the chairman of the English Reception Committee. The morning of Tuesday, Wednesday, and probably Thursday, will be devoted to the reading and discussion of papers, which will, as far as practicable, be printed previous to the meeting in French and English. The list of papers at present includes the following:—Description of the geological features of the coal and iron bearing strata, of Belgium; the development of the Belgian iron trade since 1830; the methods of making coke in Belgium; the iron ores of the Luxemburg district; BÜTTGENBACH'S system of constructing blast furnaces; machinery for Bessemer plant; the Diamond Rock Borer, &c. Facilities will be afforded for the exhibition of models, specimens, &c. The principal ironworks in the locality will be visited. On Tuesday evening the members will be entertained at a banquet, by the representatives of the iron and allied trades of the district. Friday will be devoted to an inspection of the Charleroi works. The invitation to visit this country extended to the Institute by our Institute of Mining Engineers is mentioned "as a proof of the interest which now attaches to the proceedings of the British Society."

THE COAL TRADE.

NEW YORK, July 30, 1873.

Anthracite.

The result of the Auction Sale, as made up by Mr. JOHN MOORE, Room 94, Trinity Building, was as follows:

Tons.	July.	August.	Advance.
Steamer, 7,500	$4 55	$4.76½	21½ cts.
Broken, 27,000	4.75	4 98	23 "
Egg, 7,500	5.02	5.27½	25¼ "
Stove, 34,000	5 26	5.38	12 "
Chestnut, 13,000	4.59	4.74	15 "

The bidding was quite spirited, and the result of the eagerness shown has been to draw general attention to the coal trade. The trade appears to be reviving fast. It is more than fair, and dealers feel very well satisfied with their prospects. Some of the Company coals are reported to be largely sold ahead, in certain sizes. At this season of the year household coal necessarily comes into demand, and the call for broken at the sale shows that the entire line of coals is actively called for.

A genius who writes to one of the daily papers from West Virginia, says that that country will send Cannel coal to New York next Winter, and retail it at $12 a ton, and, with that comforting prospect he presses the hand of the Metropolis with this kind assurance: "New York may congratulate itself that the future periodical miners' strikes in Pennsylvania will be of little moment to Gotham, for New York, on a pinch, *can* burn bituminous coal. Anthracite will soon come down when it finds bituminous a fatal competitor." We are happy to say that, so far as can be told at present, the "combination" will have to wage the bitterest war against consumers for a long time before Cannel coal at $12 a ton can hope to be a rival to anthracite.

Bituminous.

Trade is rather dull as is natural to the season. Prices are quoted at $7 in New York, alongside. Prices are therefore well maintained, and the movement in anthracite may have the effect of raising them somewhat especially in view of the fact that the coal producers seem to have plucked up a wonderful spirit this year. Foreign coals are very firm.

Anthracite Coal Trade for 1872 and 1873.

The following table exhibits the quantity of Anthracite Coal passing over the following routes of transportation for the week ending July 26, 1873, compared with the week ending July 27, 1872.

COMPANIES.	1872. WEEK.	1872. TOTAL.	1873. WEEK.	1873. TOTAL.
Phila & Reading R.Rs.	92,934	2,631,209	119,475	2,693,324
Schuylkill Canal	18,254	435,157	20,651	363,176
Lehigh Valley R. R.	61,134	1,972,379	61,867	2,004,962
Lehigh & Sus. R. R.	37,103	998,035	41,274	1,086,379
" Canal	25,124	361,285	25,461	317,969
Scranton North	16,487	398,475	2,531	461,807
" South	43,965	1,276,815	35,4[illegible]	1,2[illegible]6,183
Penn. Coal Co., rail	22,126	657,183	28,145	691,047
" " " canal	327	2,749	240	4,203
Del. & Hud C. Co. Canal	40,859	677,767	46,742	691,266
" " East	8,359	334,912	8,110	221,109
" " West	9,089	215,214	13,579	275,826
" " South	7,148	207,265	1,412	129,617
Shamokin	14,056	330,329	15,783	334,029
Trevorton	....	....	....	....
Lykens Valley Coal Co.	....	....	....	....
Wyoming North	....	....	....	....
Wyoming South	....	....	....	....
P. N. Y. C. & R. R. Co.	11,085	368,501	14,902	418,040
Williamstown Co'y	....	....	....	....
Big Lick Col	....	....	....	....
Total	411,034	10,716,471	455,655	11,146,917
1872			411,034	10,716,471
Increase			44,521	430,446
Decrease				

These figures are for the week and fiscal period commencing Nov. 30

† Less coal transported for Company's use and Bituminous coal.

Bituminous Coal Trade, 1872 and 1873.

The following table exhibits the quantity of Bituminous Coal passing over the following routes of Transportation for the week ending July 26, 1873, compared with week ending July 27, 1872.

COMPANIES.	1872. Week.	1872. Year.	1873 Week.	1873 Year.
C. & O. Canal*	....	320,284	....	325,615
B. & O. R. R*	....	678,271	....	763,832
Penn. S. Line*	....	....	....	45,165
H. & B. T. R. R.	5,784	165,589	6,872	248,140
*Harrisburg & D	6,893	284,478	5,964	201,167
*L. V. R. R.	642	18,103	332	18,267
P. & N.Y.C. & R. Co.	7,337	221,137	5,643	186,395
Cumberl'd Branch Canal*	....	105,336	....	58,709
" Railroad*	....	10,269	....	56,655
Total	20,456	1,802,457	18,811	1,905 945
	18,811		....	1,802,457
Decrease	1,645			
Increase	....		....	103,488

* The tables marked thus (*) have not been received up to the date of going to press.

Philadelphia & Reading Railroad and Branches.

COAL TONNAGE

For the Week ending Saturday, July 26, 1873.

BY RAILROAD.—ANTHRACITE.

PASSING OVER MAIN LINE AND LEH. VAL. BRANCH.

	Tons.	Cwt.
From St. Clair	29,348	14
" Port Carbon	4,527	06
" Pottsville	7,368	08
" Schuylkill Haven	34,783	15
" Pine Grove	5,399	15
" Tamaqua	13,110	05
" Harrisburg	73	07
" Dauphin	8,273	09
Total	97,784	19

FOR SHIPMENT BY CANAL.

Passing Frackville Scales	8,576	16
" Mill Creek "	726	02
" Schuylkill Valley Scales	262	05
" Mt. Carbon "	1,415	12
" Cressona "	8,741	18
" Pine Grove "	1,504	13
" Tamaqua "	542	03
Total	21,769	09

SHIPPED WESTWARD VIA CATAWISSA AND WILLIAMSPORT BRANCH AND NORTHERN CENTRAL RAILROAD.

Via Catawissa & Williamsport Br.	112	08
" N. C. R. R. passing Locust Gap	1,812	01
" " " Shamokin	4,989	12
" " " Herndon	....	
Total	6,914	01

SHIPPED WEST OR SOUTH FROM PINE GROVE.

Via Schuylkill & Susquehanna R. R.	1,263	17
" Lebanon & Pine Grove Branch	753	03
Total	2,017	00

CONSUMED ON LATERALS.

From Frackville Scales	737	11
" Mill Creek "	395	05
" Schuylkill Valley Scales	58	17
" Mt. Carbon "	649	08
" Cressona "	248	04
" Pine Grove "	338	02
" Tamaqua "	47	14
Total	2,495	01

LEHIGH AND WYOMING COAL.

Received via Silverbrook Junction, Sent East	9,036	02
" " Cat. & Wpt. Br. " West	....	
" " Rupert, Cat. & Wpt. Br.	....	
" " Allentown, E. Penn'a br.	78	15
" " Alburtis, " " "	....	
" " Oreland, G. & N. Br.	798	10
" " Willow Street R. R.	300	00
Total	10,213	07

BITUMINOUS.

From Harrisburg	5,743	16
" Connecting R. R., G. & N. Br.	....	
" Junction R. R.	220	00
Total	5,963	16

COAL FOR COMPANY'S USE.

Anthracite	6,844	05
Bituminous	241	10
Total	7,085	15

RECAPITULATION.

	Total for Week.	Corres-p'g week last year.	Increase and Decrease.
Passing over Main Line and Leh. Val. Branch	97,784 19	80,484 09	i 17,300 10
For Shipment by Canal	21,769 09	20,120 16	i 1,648 13
Shipped Westward via Northern Central R. R.	6,914 01	6,317 03	i 556 18
Shipped West or South from Pine Grove	2,017 00	1,979 18	i 37 02
Consumed on Laterals	2,495 01	2,541 16	d 46 15
Lehigh and Wyoming Coal	10,213 07	1,581 07	i 8,632 00
Total Anthracite paying freig't	141,193 17	113,055 00	i 28,138 17
Bituminous	5,963 16	6,892 15	d 928 19
Total of all kinds paying freig't	147,157 13	119,947 15	i 27,209 18
Coal for Company's use	7,085 15	4,997 11	i 2,088 04
Total Tonnage for Week	154,243 08	124,945 06	i 29,298 02
Previously this year	3582245 06	3499800 06	i 82,445 00
Total to date	3742488 14	3620745 12	i 121,743 02

SHIPPED BY CANAL.

From Schuylkill Haven	18,383 10	17,899 06	i 484 04
" Port Clinton	2,267 00	2,018 00	i 249 00
Total Tonnage per Week	20,650 10	19,917 06	i 733 04
Previously this year	343,176 10	420,447 19	d 77,271 09
Total to date	363,827 00	440,365 05	d 76,538 05

Delaware and Hudson Canal Company.

Coal mined and forwarded by the Delaware and Hudson Canal Company for the week ending Saturday, July 26, 1873.

	WEEK.	SEASON.
By Delaware and Hudson Canal	46,742	691,266
By Railroad, East	8,110	221,109
" West	13,579	275,826
" South	1,412	129,617
Total 1873	69,843	13,178 18
Corresponding time in 1872:		
By Delaware and Hudson Canal	40,869	677,767
By Railroad, East	8,359	334,912
" West	9,089	215,214
" South	7,148	207,265
Total	65,465	1,435,158
Decrease	117,340	

Delaware Lackawanna & Western Rail Road Company.

Coal transported on the Delaware, Lackawanna, & Western Railroad for the week ending Saturday, July 26, 1873

	WEEK. Tons. Cwt.	YEAR. Tons. Cwt.
Shipped North	21 83/ 03	461,806 14
Shipped South	35,425 19	1,256,182 10
	57,261 02	
Total		1,717,989 04
For the Corresponding time last Year:		
Shipped North	16,486 13	388,474 19
Shipped South	43,965 10	1,226,814 18
Total	60,452 03	1,615,289 17
Increase		102,699 07
Decrease	3,191 01	

Report of Coal Transported over Lehigh Valley Railroad

Report of coal tonnage for the week ending July 26, 1873, with Totals to date, compared with same time last year.

WHERE SHIPPED FROM.	WEEK. Tons. Cwt.	TOTAL. Tons. Cwt.
Total Wyoming	15,643 12	539,630 00
" Hazleton	43,302 12	1,320,580 08
" Upper Lehigh	....	2,099 09
" Beaver Meadow	14,524 13	411,846 04
" Mahanoy	13,949 11	296,177 00
" Mauch Chunk	28 06	2,369 04
Total	85,518 14	2,561,702 05
Same time last year	84,261 09	2,459,790 02
Increase	1,257 05	101,912 03
Decrease	.....	.....
Forwarded East from Mauch Chunk by rail	61,866 15	2,004,962 00
Same time last year	64,134 03	1,972,379 05
Increase	.....	32,582 15
Decrease	2,267 08	

DISTRIBUTED AS FOLLOWS.

Local East of Mauch Chunk	1,151 12	42,196 12
Forwarded East for use L. V. R.	840 00	34,346 00
Delivered to Furnaces and Manufacturing Companies	11,720 19	446,970 11
Delivered to Cat & Fog. R. R	186 18	3,815 00
" " East Penn R. R.	42 12	6,389 09
" " North Pennsylvania Railroad	5 247 12	201,463 02
" " Port Del	5 075 14	102,999 01
" " East' Amboy Railroad	....	....
" " Morris and Essex Railroad	3,225 10	183,305 06
" " Bel. Del Railroad	24,304 11	618 5[illegible] 15
" " Central Railroad	9,950 07	358,901 02
Delivered at and above Mauch Chunk for use of L. V. R.R.	1,091 04	44,837 06
To P. & N. Y. R. R.	12,283 09	275,978 13
To North-rn Central R. R.	99 03	9,777 01
To D. H. & W. R. R.	558 09	21,8[illegible] 05
To L. & S. R. R. at Packerton for rail	228 10	8,257 18
To Individuals at Mauch Chunk	21 01	1,789 05
To Individuals above Mauch Chunk	125 00	9 513 11
To L. & S. R. R., at Penn Hav., for railroad		1 541 10
Do. for canal	6,672 08	97 945 01
To Lehigh Canal Mauch Chunk	2,642 17	38,173 06
To Catawissa Railroad		50 00
To L. & B. R. R. at Lack. Junc.		49,940 08
Total	85,518 14	2,561,702 05

Report of Coal Transported over the Lehigh Canal

For the week ending July 25, 1873.

REGIONS SHIPPED FROM	TIDE. tons. ct.	LOCAL. tons, ct.	TL WEEK tons cwt.	TL. DATE tons, cwt.
Mauch Chunk Region	4,183 10	4,283 13	8,467 03	105,822 10
Mauch Chunk Region Hazardville	375 10	93 04	468 14	6,965 04
Beaver Meadow Region	1,935 17	3,634 17	4,670 04	55 830 07
Mahanoy Region	91 05	1,007 11	1,098 16	10,323 15
Hazleton Region	1,277 15	5,324 11	6,602 06	97,945 01
Upper Lehigh Region	182 14	940 16	1,123 15	13,774 15
Wyoming Region	1,693 13	1,340 01	3,033 14	46,599 16
Wyoming Region, Hazardville				736 03
Total	8,439 14	16,624 13	25 464 07	337,999 11
Previously reported	116323 00	196212 04	312,535 05	
Total to date	124762 14	212836 17	337,999 11	
Corresponding week last year	140802 14	220981 11	361,385 05	
Increase				
Decrease	15,640 00	7,745 14	23,385 14	

DISTRIBUTION.	WEEK 1873.	WEEK 1872.	YEAR. 1873.	YEAR. 1872.
Consumed on line of Lehigh Canal	2,444 18	1,820 09	34,100 00	35 615 06
Passed into Morris Canal to Tidal Points	324 01	256 18	1,250 19	2,529 11
Passed into Morris Canal to Local Points	980 12	537 05	12,865 11	10,421 18
Passed into Del. & Rar. Canal to Tidal Points	8,505 13	9,573 06	123,911 15	133,293 03
Passed into Del. & Rar. Canal to Local Points	281 12	277 07	6,064 02	7,061 17
Consumed on line Delaware Div Canal	2,415 11	1,734 15	18,226 09	22,494 05
Passed through to Bristol	10,502 00	10,924 14	143,520 15	144,089 05
	25,454 07	25,127 13	337,999 11	361,385 05

Report of Coal Transported over Central R.R. of N. J. (Lehigh and Susq. Div.)

Week ending July 26—Compared with same time last year

REGION SHIPPED FROM.	TIDE. tons ct.	LOCAL. tons ct.	CANAL. tons ct.	TL WEEK tons cwt.	TL. DATE tons. cwt.
Wyoming	25901 00	8274 07	3067 05	37446 12	997297 19
Upper Lehigh		2919 08	1153 07	3064 15	112548 06
Beaver Meadow	3262 11	1564 09	3312 09	8139 09	145516 15
Hazleton		339 00	6551 11	6891 11	1 4498 16
Mauch Chunk	2778 14	4913 18	8200 14	15893 06	286751 14
Total	31442 05	17905 02	22287 06	71634 13	1,638541 10
Prev'ly reported	752345 04	558512 17	275948 16	1586906 17	
Total to date	783787 09	576517 19	298236 02	1658541 10	
Same time 1872	667961 19	459512 03	229.93 06	1356767 08	
Increase	115825 10	117005 16	68942 16	301774 02	
Decrease					

DISTRIBUTION.	WEEK 1873.	WEEK 1872.	YEAR 1873	YEAR 1872.
Forwarded East by Rail to Tidal points	31442 05	24351 06	783787 09	667961 19
Forwarded East by Rail to Local points	7728 18	11073 00	246618 19	221096 08
Forwarded East by Rail use Central Division	1899 09	1529 11	5 532 03	44064 12
Forwarded East by Rail use L. & S.	203 06	148 17	8290 05	4912 10
Delivered at and above Mauch Chunk	1488 17	1003 18	44430 00	37466 00
Delivered at Coalport & Hazard for Canal	23811 19	18162 07	33:007 00	257296 07
Delivered to L. V. R. R. at Packerton	156 10	65 02	15028 18	8347 13
Delivered to L. V. R. Rd. at Sugar Notch	1061 19		57780 05	
Delivered to L. & B. R. R.at Plymouth Bridge	3941 10	3800 19	120966 08	122683 19
Total	71634 13	60234 11	1658541 10	1356767 08

Penn. and N. Y. R. R.—Coxton, Pa.

Coal tonnage for week ending July 26, 1873.

	Week. Tons.	Cwt.	Total. Tons.	Cwt.
Anthracite received:				
From Lehigh Valley R. R.	12 233	09	2 5,3.8	13
" Lack. & B. R. R.	555	11	17,744	11
" Pleasant Valley R. R.	1,350	08	103,668	02
" Sul. & Erie R. R.	752	17	21,?48	08
Total	14,902	05	418 039	14
Same time last year	11,084	13	368,601	07
Increase	3,817	12	49,438	07
Decrease				
Distributed:				
To Lehigh Valley R. R.			23,568	01
To Lack. & B. R. R.	49	18	869	13
To S. Central R. R.	1,571	02	92,322	09
To Ithaca & A. R. R.	4,357	19	79,462	19
To Erie R. W. Pockets for shipm't.	7,027	02	147,095	03
To Erie R ilway, Wat'kins direct.	287	18	3,763	12
To individuals on line of road	184	03	18,046	08
To points at & above Coxton for use of Co.	429	09	17,384	10
To points between Waverley and Elmira	535	04	35,528	18
Total	14,902	05	418,039	14
Bituminous received from BARCLAY R. R.				
Shipped north from Towanda	5,599	09	184,988	12
Shipped south from Towanda	43	08	1,314	07
Northern Central R. R.			91	14
Total	5,642	17	186,394	13
Same time last year	7,337	04	221,137	01
Increase	1,694	07		
Decrease			34,742	08
Distributed:				
To Erie Railway	5,544	07	165,147	08
To So. Central R. R	55	02	19,525	08
To Ithaca Valley R. R.			275	19
Lehigh Valley, R. R.			592	16
To individuals on line of Railroad.	43	08	734	18
To points on line of road for use of Company			118	04
Total	5,642	17	186,394	13
Grand totals transported				
Anthracite	14.902	05	418 039	14
Bituminous	5,642	17	186 394	13
Total	20,545	02	604,434	07
Same time last year	18,421	17	589,738	03
Increase	2,127	05	14,695	19
Decrease				

Statement of Coal Transported over Cumberland and Pennsylvania Railroad

During the week ending Saturday July 19, and during the year 1873, compared with the corresponding period of 1872.

WEEK.

	C. & O. C'l Tons.	Cwt.	B. & O. R. R. Tons.	Cwt.	Pa. S. Line Tons.	Cwt.	Total. Tons.	Cwt.
1873	25,236	15	33,349	02	602	10	57,28	07
1874	15,422	10	25,705	06	....		41,127	16
Increase	7,914	05	7 643	16	602	10	16,160	11
Decrease								

YEAR.

1873	325,014	14	765,831	11	45,164	18	1,134,611	03
1872	320,284	06	678,271	07	....		998,555	13
Increase	5,730	08	87,560	04	45,164	18	134,055	10
Decrease								

Cumberland Branch R. R.

WEEK.

	To C. & O. Canal. Tons.	Cwt.	To B. & O. R. R. Co Tons.	Cwt.	Total. Tons.	Cwt.
1873	6,161	02	252	00	6,416	02
1872	6,839	8	529	13	7369	11
Increase						
Decrease	675	16	277	13	953	09

YEAR.

1873	58,709	04	56,655	19	115,365	03
1872	105,336	02	10,269	09	115,605	11
Increase			46,386	10		
Decrease	46,626	18			240	08

Delaware and Hudson Canal Company.

Coal mined and forwarded by the Delaware and Hudson Canal Company for the week ending Saturday, July 26, 1873.

	WEEK.		SEASON	
North	51,198	16	1,422,193	08
South	1,411	18	129,617	09
Total 1873	52,610	14	1,621,810	17
Corresponding time in 1872:				
North	46,311	04	1,458,049	11
South	7,148	09	207,265	14
Total, 1872	53,459	13	1,665,315	05
Increase North	4,887	12	34,143	17
Decrease South				
Increase South				
Decrease South	5,736	11	77,648	04
Increase				
Decrease	848	19	43,504	08

Northern Central Railway, Shamokin Division.

Below is the return of Coal sent over the Shamokin Division of the N. C. R. W., for the 7 days ending July 25, 1873.

	Tons.	Cwt.
East	1 359	11
West	14,423	16
	15,783	07
Same time last year	14,056	01
Increase		
Decrease	1,727	06
Total amount shipped to date	332,028	15
Same time last year	300,325	02
Increase	31,703	13
Decrease		

Pennsylvania Coal Company.

Shipments of Pittston Coal for the week ending July 26, 1873.

	1873. WEEK.	YEAR.	1872. WEEK.	YEAR.
By Railway	28,945 02	669,047 05	22,125 17	657,181 11
" Canal	240 10	4,203 02	357 02	2,749 09
	29,185 12	673,250 07	22,482 19	659,932 00
Increase, 1873	14,318 07			

Prices of Coal by the Cargo.

(CORRECTED WEEKLY.)

	AT NEW YORK R. A.	W. A	AT PHILADELPHIA. R. A.	W. A.
SCHUYLKILL.				
Lump	$- —	$5 45	— —	4 10
Steamer	— —	5 45	— —	4 10
Broken	5 70	5 45	4 35	4 10
Egg	5 85	5 60	4 50	4 25
Stove	6 05	5 75	4 70	4 40
Chestnut	5 20	5 95	3 85	3 60
Pea	— —	— —	— —	— —
LEHIGH.				
Freight to New York 50 cents.			— —	— —
Lump, (on board)	— —	— —	— —	— —
Broken	— —	— —	— —	— —
Egg	— —	— —	— —	— —
Stove	— —	— —	— —	— —
Chestnut	— —	— —	— —	—
Pea	— —	— —		
SPECIAL COALS.*				
Honey Brook, Le'h W. A.	4 85@5 55		— —	— —
Spring Mountain " "	5 60@— —		— —	— —
Sugar Loaf " "	4 90@5 70		— —	— —
Room Run " "	4 70@5 55		— —	— —
Hill & Harris " "	4 70@5 60		— —	— —
Shamokin " "	4 70@5 50		— —	— —
Lykens Valley " "	4 85@6 10		— —	— —
Broad Top " "	6 60@— 10		5 35	— —

Company Coals.

August, 1873.

	L.	Stc.	Ara.	Eg.	Sto.	Chest
*Scranton at E. Port	— —	— —	— —	— —	— —	— —
†Pittston at Newburgh	4 80	4 80	4 90	4 90	5 30	4 80
*Lackawana at Rondout	4 85	4 95	5 05	5 20	5 40	4 85
Wilk'b're at Hoboken	4 85	4 95	5 05	5 20	5 40	4 85
Old Co. Lehigh at Pt. John'n	5 89	—	5 65	5 65	5 70	5 60
New York Coal Exchange	5 65	—	5 50	5 50	5 65	4 95

For freights to different points see "Freights"
*To contractors only.

Prices at Baltimore—August, 1873.

Wholesale Prices to Trade.

Wilkesbarre, by cargo or car load	$5 50@5 75
Pittston and Plymouth, do	5 35@5 50
Shamokin Red or White Ash, do	5 35@5 65
*Lykens Valley Red Ash, do	—@6 00
By retail, all kinds per ton of 2,240 lbs	7 00@8 00
*George's Creek and Cumberland f. o. b. at Locust Point for cargoes	4 85@5 00
West Va. and Youghigheny gas f. o. b. at L. Point	6 50
Kanawha Cannel, coarse	@12 00

* Freight to New York $2 15.

BITUMINOUS COALS.

Kittaning Coal Co.'s Phœnix Vein, f. o. b. at Phila	‡
" " Lemon " " "	
Cumberland Vein Coal	
Tyrconnel f. o. b.	$7 00

Prices at Georgetown, D.C., and Alexandria, Va.

August, 1873.

George's Creek and Cumberland f. o. b. for shipping $- —@4 75

Prices at Havre de Grace, Md.

August, 1873.

Wilkesbarre and other White Ash for Cargoes	$5 00@5 25
Lykens Valley	5 25@5 50
Shamokin Red or White Ash	5 75@6 00

Bituminous Coals (Cumberland).

Georgetown, F. o. b.	$4 60
Baltimore	5 00
New York	7 25
South Amboy	7 50

Prices of Foreign Coals.

August, 1873.

Duty 75 c. per ton.

Corrected weekly by ALFRED PARMELE, No. 32 Pine street, N. Y.

Liverpool Gas Caking	— —@— —
" " Cannel	17 00@— —
" House "	20 00@22 00
" Orrel	20 00@— —

Per ton 2,240 lbs., ex-ship.

PRICES FROM YARD.

Liverpool House Orrel, screened	$20 00@22 00
"Cannel, "	22 00@25 00

Per ton 2,000 lbs. delivered.

Prices of Gas Coals.

August, 1873.

PROVINCIAL.

Corrected weekly by Louis J. Belloni, Jr., 41-43 Pine st., N. Y

	Coarse	Slack
Rock House, f. o. b. at Cow Bay	$2 50	$1 25
Gowrie	2 00	0 00

Corrected by Bird, Perkins & Job, 27 South street.

	Coarse.	Culm of Coal.
Pictou	bett $3 00	1 50
Sydney	3 25	1 00
Lingan	2 75	1 00
Caledonia	2 75	1 25

A discount from the prices of the coarse Coal on purchase of 5000 tons and upwards. Duty on all slack coal or Culm: 40c. per ton of 28 bushels, 80 pounds to the bushel. On all bituminous coal or shale: 75 cents per ton or 28 bushels.

AMERICAN.		Nominal quo Currency.
Westmoreland	f. o. b.	$6 00 @7 00
Fairmount Gas Coal Co. of N. Y.	"	6 50 @7 00
Despard Coal Co	"	6 50 @7 00
Penn	"	6 50 @7 00
Newburg Orrel Gas	"	6 50 @7 00
West Fairmount Gas Coal	"	6 50 @7 00
Redbank Cannel, at Pa	"	12 00 @0 00
AT PHILADELPHIA.		
Westmoreland	"	7 50 @0 00

Rates of Transportation to Tide Water.

BY RAILROAD.

TO PORT RICHMOND, PHILADELPHIA.

Philadelphia and Reading Railroad, from Schuylkill Haven Lump and St., net, $1 60; Br., Egg and Ch., $1 65; Stove, $1 75 Shipping at Pt. R., 20c., for use at Phil., $2 18 from Pt. Carbon,

MAUCH CHUNK TO ELIZABETHPORT.

L. V. Railroad from Mauch Chunk to Phillipsburgh	$0 72
C. R. R., N. J., Phillipsburgh to Elizabethport	66
Shipping expenses at Elizabethport	25
Wharfage	10
Total	$2 23

MAUCH CHUNK TO PORT JOHNSTON.

L. V. R. R., or L. & S. R. R. from M. C. to Phillipsb'g	$0 72
C. R. R., of N. J., Phillipsburgh to Pt. Johnson	1 06
Shipping expenses	25
Wharfage	10
Total	$2 23

TO HOBOKEN

L. V. R. R., Mauch Chunk to Phillipsburgh	72
Morris & Essex R. R. Phillipsburgh to Hoboken	1 06
Shipping expenses	25
Wharfage	00
Total	$2 23

TO SOUTH AMBOY.

L. V. R. R.	
E. & D. R. R.	}
Cam. & Am R. R.	}
Shipping Expenses	35
Total	$2 23

PENN HAVEN TO ELIZABETHPORT.

L. V. R R. Penn Haven to Phillipsburgh	84
C. RR. of N. J. Phillipsburgh to Elizabethport	1 06
Shipping expenses	15
Wharfage	20
Total	$2 35

Freights.—August, 1873

TO EASTERN PORTS.	Cumberland. From Georgetown.	From Baltimore	Anthracite. From Philadel'a.	From Eliz. Port, Port Johnston, Perth Amboy, Hoboken.	From Newburgh.	From Rondout.
Amesbury	3 75	—		1 90	—	—
Bangor	3 25	—		1 90	—	—
Bath	3 00	3 00		2 05	—	—
Boston	2 50	3 00		1 90*	2 25	2 05
Bridgeport	2 10	2 50		1 00	—	1 25
Bristol	—	—		1 40	—	1 35
Cohasset Nar'ows	3 10	—		—	—	—
Derby	3 00	—		1 75†	—	—
Dighton	2 6.	—		—	—	—
East Cambridge	2 75	—		1 90	—	—
Fall River	2 55	2 60		1 40	1 60	1 55
Hackensack	—	—		—	—	—
Hartford	3 00	3 25		1 50	—	1 75
Hoboken	2 10	—		50	—	65
Jersey City	2 15	—		50	—	65
Lynn	—	—		—	—	—
Middletown	—	—		1 25	—	1 50
Mystic	—	—		1 25	—	—
New Bedford	2 60	2 85		1 45	—	1 60
Newburyport	3 25	3 12		2 00	—	2 15
New Haven	2 50	2 50		1 00	1 20	1 25
New London	2 60	2 60		1 20	1 40	1 45
Newport	2 60	—		1 40	1 60	1 55
New York	2 25	2 15		55	—	65
Norwalk	2 55	2 50		1 00	—	1 25
Norwich	2 60	2 60		1 30	1 60	1 55
Pawtucket	1 50	2 80		1 50‡	—‡	— —
Portland	3 00	3 00		1 80	—	1 80§
Portsmouth, N. H	3 25	3 12		1 95	—	1 95
Providence	2 60	2 60		1 40	1 60	1 55
Rockport	—	—		—	—	—
Saco	—	—		—	—	—
Sag Harbor	—	—		1 25	—	—
Salem	3 20	3 00		2 00	—	2 05
Stamford	—	—		1 00	1 20	1 25
Stonington	—	—		1 25	—	1 40
Taunton	—	—		1 90	—	—
Warren	—	—		1 40	—	—
TO RIVER PORTS						
Albany	2 50					55
Catskill	—					50
Cocksackie	—					50
Coeyman's	—					65
Cold Spring	—					20
Fishkill	—					20
Haverstraw	—					40
Hudson	2 40					40
New York vessels	2 00					65
Nyack	—					45
Poughkeepsie	2 40					50
Rhinebeck	—					50
Rondout	—					—
Saugerties	—					40
Sing Sing	—					50
Stuyvesant	—					55
Tarrytown	—					50
Troy	—					60
West Point	—					20
Yonkers	—					50

† 3 c. per bridge per ton in addition to freight.
† New Haven rate and towing 25 c. extra per ton.
‡ Towing from Providence and return, extra.
§ And Towing.

St. Thomas	$- — Gold
Martinique	— — "
Demerara	— — "
New Orleans	— — "
Mobile	— — "

Foreign and Provincial Freight

August, 1873.

Foreign.

Newcastle and Ports on Tyne, per keel of 21 1-5 tons £
Liverpool, 5 per cent primage

TO NEW YORK.

Provincial

Sydney	
Lingan	$3 5
Cow Bay	4 00
Port Caledonia	4 00
Little Glace Bay	4 00

TO BOSTON.

Sydney	4 00
Lingan	3 50
Cow Bay	3 60
Port Caledonia	3 50
Little Glace Bay	3 50

TO MONTREAL.

Caledonia	3 75 gold

TO CUBA.

Caledonia	9 50 gold.

MARKET REVIEW.

NEW YORK, July 30, 1873.

IRON—The business in Scotch Pig is light, and mostly confined to jobbing parcels to meet the wants of the Trade. There is a fair inquiry, but as nearly all the stock is held firmly on speculation, sales are only made at full asking prices. Eglinton is quoted $45@$46, Glengarnock $46@$47, Gartsherrie $47.75@$48, and Coltness $51@$52, the lower price for the latter being strictly cash; small lots of Gartsherrie (75@100 tons altogether) sold at $47.75; and 100 do. Coltness, to arrive, $52. American Pig is in fair demand, the present ruling prices being lower than those of Scotch, have turned the attention of dealers more to American; the only sales are 100 tons No. 2 X, and 200 do. Gray Forge, on private terms. Old English Rails are in few hands, and are held above present market rates; 150 tons D. H. sold at $48 - T may be quoted $47. Scrap is in better inquiry, principally for lots from dock, but we hear of no business; we quote $35@$37 from dock and from yard, nominal. Refined Bar continues dull, and prices are rather nominal, but there is no declared change.

THE IRON TRADE OF PITTSBURGH.—We gather some facts relating to the Iron Trade of that city from the Pittsburgh *Gazette*. From the account given in that paper it appears that the first blast furnace in Western Pennsylvania was started about 15 miles from Pittsburgh in 1790. In 1804 the first foundry was erected in Pittsburgh. In 1814 a cannon foundry was started which grew into the famous Fort Pitt Foundry. In 1829 Pittsburgh had five rolling mills, employing 300 men. The development of blast furnaces has been attended with extreme difficulty. Up to 1872, there were only five in blast in Pittsburgh, yielding 1000 tons a week. Now there are twelve with a capacity of 3,600 tons a week. In Alleghany County by the last census the number of Iron and Steel working establishments was eighty-seven, employing 13,429 hands, whose yearly wages amounted to $8,210,867. In these is represented an invested capital of $22,858 247, and a net product of $39.189,044. In 1871, the total receipts of Iron Ore, Pig Metal and Blooms were 367,207 tons, and in 1872. 496,648 tons, an increase in one year of 129,441 tons.

LEAD—Foreign Pig is quiet, but steady; 100 tons Spanish sold at 6¼ cents gold. Domestic is held 6¼ cents gold. Bar 9¼ cents, Sheet and Pipe 10½.

Withdrawals from bond for consumption 25th, 26th and 28th July—

Lead, Spain.....pigs.576

COPPER.—New Sheathing is steady at 38 cents, and Bolts and Braziers 40, Bronze and Yellow Metal sheathing 27, and Y. M. Bolts 32, net cash. Ingot for present delivery is quiet but firm at rather better prices; 50,000 lb. Lake sold at 27½ cents. For future delivery, there has been a pretty active business, and we notice further sales of 2,000 lb. Lake from September, '73, to March, 74, nearly all at 28 cents.

STEEL.—Continues steady at our quotations, with somewhat better supplies of English Cast, though there is no surplus.

REGULUS ANTIMONY.—May be quoted 13½@13¾ cents gold.

SPELTER.—Remains very quiet, and the course of the market is still in buyers' favor; we quote Silesian nominally 7⅛@7½ cents gold. Domestic 10 cents currency.

TIN.—Pig remains very quiet, and we only hear of the sale of five tons English, August shipment, at 29 cents gold; Straits is held at 31⅜@32 cents, including Malacca, English 30, and Banca 35 gold. Cables from London quote Straits £131, and English £132. The demand for Plates is also light, and prices are easier; sales have been made of 1500 bxs. assorted Charcoal Tin, part $11 25 in lots; 300 do. ½d X $11.37½; 1500 do. Coke Tin, $8.75; 100 bxs. do. 10 by 20, $14.50; and 300 do. Coke Terne, $8.50, all gold; we now quote Charcoal Tin, $11@$11.37½; Coke Tin, $8.75@$9.25; Coke Terne, $7.75@$8.75; and Charcoal do. $9.75@$10.25 gold.

Withdrawals from bond for consumption 25th, 26th, and 28th July—

Tin from England..... bxs 300

ZINC—Mosselmann Sheet is quoted 10 cents less 4 per cent. from Agents' hands, without any reported sales since the advance some time since. Manganese black oxide 4 cents, do. Gray 5¼ cents.

METALS.

NEW YORK, July 30, 1873.

IRON.—Duty: Bars, 1 to 1¼ cents ₩ lb; Railroad, 30 cents ₩ 10 lbs.; Boiler and Plate, 1½ cents ₩ lb; Sheet, Band, Hoop, and Scroll, 1¼ to 1¾ cents ₩ lb; Pig, $7 ₩ ton; Polished Sheet, 3 cts. ₩ lb; Galvanized 2¼; Scrap Cast, $6; Scrap Wrought, $8 per ton. All less 10 per cent. No Bar Iron to pay a less duty than 35 per cent. ad val.

	Store Prices.
Pig, Scotch—Coltness ₩ ton	$1 00@$52 00
Gartsherrie	47 75@48 00
Glengarnock	46 00@47 00
Eglinton	45 00@46 00
Pig, American, No. 1	45 00@47 00
Pig, American, No. 2	42 00@44 00
Pig, American, Forge	35 00@37 00
Bar Refined, English and American	— —@— —
Bar Swedes, assorted sizes gold	— —@137 50

	Store Prices, Cash.
Bar, Swedes, 1⅝ to 5 x ⅜ & ⅞ 2 sq. & 6 to 12 x ⅜ & ⅛	175 00@185 00
Bar, Refined, ¾ to 2 in. rd. & sq. 1 to 6 in. x ⅜ to 1 in.	92 50@ 95 00
Bar, Refined, 1¼ to 6 by ¼	97 50@100 00
Bar, Refined, 2⅛ to 2⅝ round 1 & 1⅛ by ¼ & 5:16	100 00@102 50
Large Rounds	102 50@117 50
Scroll	112 50@145 00
Ovals and half-round	120 00@140 00
Band	110 00@112 50
Horse Shoe	— —@122 50
Rods, ⅜ to 3-16inch	97 50@140 00
Hoop	120 00@170 00
Nailrod	9¼@ 9½
Sheet, Russia, as to assortment (gold)	17 @ 18½
Sheet, Singles, D. and T. Common	—6 @— 7
Sheet, D. and T. Charcoal	—7 @— 8½
Sheet, Galv'd, list 10 per cent, discount	— —@— —
Rails, English (gold), ₩ ton	68 00@ 70 00
Rails, American, at Works in Pennsylvania, currency	78 00@— —

COPPER.—Duty: Pig, Bar, and Ingot, 5; old Copper 4 cents ₩ lb; Manufactured, 45 per cent. ad val.

	All Cash.
Copper, New Sheathing, ₩ lb	— @— 38
Copper Bolts	— @— 40
Copper Braziers, 16oz. and over	— @— 40
Copper Nails	— @— 45
Copper, Old Sheathing, &c. mixed lots	26 @— 27
Copper, Old, for chemical purposes, 14@16 oz	— @— —
Copper, American Ingot	27½ @— —
Copper English Pig	— @— —
Yellow Metal, New Sheathing & Bronze	— @— 27
Yellow Metal Bolts	— @— 32
Yellow Metal Nails, Sheathing an l Slat'g	27 @— 30

LEAD.—Duty: Pig, $2 ₩ 100 lbs.; old Lead, 1½ cents ₩ lb Pipe and Sheet, 2½ cents ₩ lb.

Spanish (gold)	6 50 @6 62½
German, do.	6 50 @6 62½
English do.	6 62½@7 00
Domestic do.	6 12½@— —
Foreign, Refined	7 25 @— —
Bar.....(net)	9 25 @— —
Pipe.....(net)	— —@10 50
Sheet	— —@10 50

STEEL.—Duty: Bars and ingots, valued at 7 cents ₩ lb or under 2½ cents; over 7 cents and not above 11, 3 cents ₩ lb; over 11 cents, 3½ cents ₩ lb, and 10 ₩ cent ad val. Store prices.

English Cast (2d and 1st quality) ₩ lb	— 18½@— 23
English Spring (2d and 1st quality)	— 9½@— 10½
English Blister (2d and 1st quality)	— 14 @— 18½
English Machinery	— 14½@— —
English German (2d an 1lst quality)	— 12½@— 14½
American Blister "Black Diamond"	— — @— 11½
American, Cast, Tool do.	— — @— 17
American, Spring, do.	— — @— 11
American Machinery do.	— 11½@— 12
American German, do	— 9 @— —

TIN.—Duty: Pig, Bars, and Blocks, 15 ₩ cent. ad val.; Plate and Sheets and Terne Plates, 25 ₩ cent.; Roofing 25. ad val.

	Gold ₩ lb.
Banca	35 @—
Straits	31⅜@32
English	29¾@30

PLATES.

Fair to Good Brands.	Gold.	Currency
I. C. Charcoal, ₩ box	$11 00 @11 37½	$13 00 @13 25
I. C. Coke	8 75 @ 9@25	10 50 @11 00
Coke Terne	7 75 @ 8 75	9 25 @10 25
Charcoal Terne	9 75 @10 25	11 50 @12 25

SPELTER—Duty: In Pigs, Bars & Plates, $1.50 p. 100lb

Plates, Foreign.....(gold).....p. 100 lb.	7 37½@— 7 50
Plates, Domestic.....p. lb.	8½@— 11

ZINC—Duty: Pig or Block, $1.50 per 100 lb.; Sheet 2½c per ₩ Sheet..... per lb.—10½@11

San Francisco Stock Market.

BY TELEGRAPH.

NEW YORK, July 31, 1873.

Our usual report from the San Francisco Stock Board was unavoidably crowded out of our last issue. The following advices are dated the 25th and 29th respectively. They evince a decided decline as compared with the report dated the 17th inst. A comparison of the two reports exhibit an unusually steady feeling in the market, if we except the movements of Belcher which shows an advance of $19 per share, during the interval between the 24th and 29th.

	July 24.		July 29.
Savage	43	—	44
Crown Point	83	—	84
Yellow Jacket	45	—	46
Kentuck, "New Issue"	7	—	6¾
Cholar Potosi	38	—	37
Gould & Curry, "New Issue"	8¼	—	8½
Belcher "New Issue"	57	—	70
Imperial	—	—	—
Raymond & Ely	—	—	56
Meadow Valley	—	—	18¾
Eureka C. V.	—	—	20
Ophir	—	—	—
Hale and Norcross	—	—	—

American Institute of Mining Engineers.

OFFICIAL BULLETIN.

Announcements to Members and Associates.

I. The ENGINEERING AND MINING JOURNAL, which is the Organ of the Institute, and contains its proceedings, transactions and notices of meetings, will be sent to each Member and Associate on the payment of his annual dues. Back numbers cannot, as a rule, be sent.

II. Dues are payable in advance at the annual (May) meeting. Remittances should be made, as far as possible, by P. O. Order, payable to the Secretary.

III. The first volume of Transactions of the Institute is in course of preparation and will be sent, as soon as issued, to all members not in arrears.

IV. General meetings are held on the fourth Tuesday of February, May and October. Authors of papers are requested to notify the Secretary, in advance of meetings, of the subject and length of their papers.

THOMAS M. DROWN, Secretary.

1123 Girard street, Philadelphia, Pa.

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ROSSITER W. RAYMOND, Ph. D.
JOHN A. CHURCH, E. M. Editors.

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CONTENTS FOR THIS WEEK.

Notes on Foreign Metallurgy	81	The American Institute of Mining Engineers	87
Rock Drilling—An Experiment	81	Advertisements	87
Vie le Voulagne	82	EDITORIALS:	
Mineralogical Notes on Utah, California and Nevada, with a Description of Tricolte, a New Borate of Lime	82	Authracite Coal in the West	89
		On the Copper Deposits of the Blue Ridge.	89
The Vienna Exposition	82	CORRESPONDENCE.—The Question of Ore Separation	90
Engineering and Mechanical Notes	83	Horizontal vs. Beam Engines for Marines.	90
Products of the Destructive Distillation of Lignite	83	Safety on Railroads	91
Heton Coignet	84	On the Origin of Clay-Iron Stone	91
Early American History	84	MINING SUMMARY:	
The British Meeting in Belgium	84	Colorado	91
THE COAL TRADE	85	Utah	92
MARKET REVIEW	87	Advertisements	93

Mr. H. ROBERTSON, the agent in New York for the German Smelting Works, desires us to say that circumstances compel him to visit his fatherland for a short time, and shippers of ore are therefore requested to address themselves direct to the general agency, in charge of R. J. ROBERTSON, Hamburg, Germany.

WE are glad to see a report that the manufacture of colored tiles has been begun in Pittsburgh. At present we draw our supply of this article from England at a cost which prevents even the rich from using them in floors. People in in this country do not understand that the immunity from fire, which beyond question characterizes European cities, lies to a great extent in the use of earthenware or similar fire-proof materials in the floors of halls. Houses are there built with interior walls of masonry, so that when the flooring of a room takes fire the wall offers a stout resistance to the spread of the evil; while the halls, which necessarily present a continuous flooring, are kept from burning, and even from taking fire, by being paved with tiles. Tiles there long preceded "oilcloth," which, in fact, is a cheap copy of the tiled floors. We have for a long time hoped to see this manufacture established in this country on a basis which would permit the manufacture of tiles at cheap rates, for we are convinced that safety from fire does not lie so much in legal restrictions as in good habits of building, and the use of incombustible material in every part of a building to which it can be adapted. We would be glad, too, to see the bright, clean floors of Southern Europe made a feature in our homes. In our climate we need to make provision for Southern Summers as well as Northern Winters. Our carpets and all the arrangements of our houses show that we have kept the latter season in view, but the day will come when we will pay quite as much attention to the demands of our torrid heats.

IT will probably surprise most of our readers, as it did us, to learn from "An Analysis of some statistics of Collegiate Education" by President BARNARD of Columbia College, that the great City of New York, containing 900,000 people, has, or had in 1870, only 434 young men in college. That was not the number sent to college each year, but the whole number attending college at a given date, and ranking from Freshmen to Senior. Of these, 127 were in colleges outside of the city, 180 were in the College of the City of New York (Free Academy), 93 were at Columbia, and 34 at the University. These are the statistics of 1870, and they show that the proportion of young men who receive what is technically called a liberal education, is very small. The cities of New York, Brooklyn, Jersey City, etc,, contain at least 1,150,000 people and had, in 1870, at most, 534 of their young men in college. This is one student to 2154 inhabitants, and as the young men between the ages of 16 and 20 form almost exactly 1-24th of the population, it follows that only one young man in 90 goes to college. It should be remarked here that Dr. BARNARD'S inquiry was strictly confined to those institutions which afford an academic education. It did not include schools of science, of art, nor of any special instruction. The number of young men who are receiving instruction in law, medicine or science is, undoubtedly, much greater than this; but Dr. BARNARD'S object was to ascertain how much attention is now paid to what is distinctively a liberal, instead of a technical education, and whether New Yorkers favored out-of-town colleges, to the disparagement of their own. He found that this is not the case. We wish he had extended his inquiry further, and ascertained the number of young men who are pursuing technical studies. It is undoubtedly true that schools of this kind have lessened the number of undergraduate students, but we fancy that they have drawn more from the ranks of business than from the colleges, and that their institution has therefore sensibly increased the proportion of instructed men in the community.

THE failures of smelting works in the West have been very numerous, and the establishments which have succeeded in treating even the simplest ores probably do not exceed three per cent. of those which have been built. But, in spite of this fact, there has been a very decided improvement in the production of American lead. The lead business has been almost revolutionized. We are not able at present to give the figures of importation, and cannot, therefore, tell how far the progressive movement has gone, but we have the authority of dealers in lead and lead paints for the assertion we have made. In St. Louis the receipts of pig lead for the six months ending June 30 were 14,128,775 pounds, which is 6,281,670 pounds in excess of the receipts for the same time in 1872. This is an increase of nearly 60 per cent., and it is an increase that is undoubtedly due principally to works in the Mississippi Valley treating ore mined in the same region. When we consider the number of lead works built in the States east of the Mississippi, which depend for their supplies chiefly upon the Territories, it is plain that, if the production of the whole country does not show an equal improvement, it must exhibit one very similar. The importance of this fact can hardly be over-estimated. For years the position of the metallurgical industries in this country—with the sole exception of iron—has been simply disgraceful. The Mississippi Valley rested upon its past glory, and its inhabitants seemed far more anxious to entice unwary foreigners into the purchase of mining lands, at exhorbitant prices, than to establish an industry which could not fail to be generally profitable to the whole district. In spite of its known resources in mineral, that part of the country notoriously fell behind in production, and was forced to become a large importer of lead, besides drawing large supplies of manufactured lead products from the East. America held in books the first place in the list of countries capable of supplying lead for the manufacture of paint, but it had lost so much energy that its paint makers really drew their supplies mainly from abroad. This state of things seems to be fairly in the way to be reversed, for the exports of St. Louis in the above-mentioned period in 1873 were 7,199,355 pounds, against 2,116,650 pounds for the same time in 1872. The ability of this increased make to supply the home market is shown by the fact that in the same time in 1872 the consumption of St. Louis was 10,857,420 pounds, and in 1872 8,730,455 pounds. Thus we see that while in 1872 the city was obliged to obtain 6,613,805 pounds from outside sources in the first half of the year, it reduced this part of its operations to 3,658,065 pounds in 1873, and yet its consumption in 1873 was more than 2,000,000 pounds above that in 1872. These figures show what important results every year may bring forth. We look with peculiar pleasure upon the resumption of an important industry, for we firmly believe that whatever ups and downs the business may have in the future, it will never again suffer such abandonment as was its lot when the superficial mines of Illinois ran low.

RECENTLY, M. FIZEAU has communicated to *Les Mondes* the results of a series of very elaborate experiments made with a view to the most accurate determination of the velocity of light. The distance between the two stations of observation, as found by triangulation, was 33,829.1 feet (about six miles), with a probable error of 0.001. The source of the ray was a jet of oxyhydric gas. Six hundred and fifty satisfactory observations were made, the mean of which gave 185,368 miles per second as the required velocity. The experiments of M. FOUCALT to determine this same velocity give us a result of 185,177 miles.

The formerly accepted determination of the velocity of light was that of OLAF ROEMER, a Danish Astronomer, who deduced it from observations on Jupiter's satellites. The earth's orbit being concentric with that of Jupiter, and interior to it, the distance of these bodies is continually varying, the variation extending from the sum to the difference of the radii of the two orbits, making the excess of the greatest over the least distance equal to the diameter of the earth's orbit. A comparison of the eclipses of Jupiter's satellites during many successive years showed that those which took place about opposition were observed earlier, and those about conjunction later than an average or mean time of occurrence. Connecting the observed acceleration in the one case, and retardation in the other, with the variation of Jupiter's distance below and above its average value, the difference was fully and accurately accounted for by allowing 16m, 26s. 6 for light to traverse the diameter of the earth's orbit. From these data ROEMER found the velocity of light to be about 192.000 miles per second.

It seems at first sight as if the recent and very accurate determination of M. FIZEAU had demonstrated a defect in the earlier method, indicating, perhaps, some cause, connected with the acceleration and retardation of the apparent occultations of Jupiter's satellites, other than the time required for light to traverse the earth's orbit. But Capt. C. W. RAYMOND, U. S. Engineers, at present As-

sistant Professor of Physics at West Point, calls attention to the curious fact that by substituting in ROEMER'S calculation a more modern and more accurate value of the diameter of the earth's orbit, the resultant measure of the velocity of light becomes 185,344 miles per second, which agrees astonishingly with the figures of M. FIZEAU. Similar experiments conducted some time ago by M. FOUCAULT indicated 185,177 miles per second as the velocity. This is one of the questions which will be affected by the thorough observations, to be made by trained astronomers of all nations, of the next transit of Venus. The diameter of the earth's orbit, which may be called our astronomical unit of distance, will be probably finally determined by those observations.

Anthracite Coal in the West.

GEOLOGISTS are aware that neither ordinary coal nor anthracite is exclusively confined to any one geological age. Wherever the natural conditions have favored the deposition and gradual formation of coal, it has been found to occur, although undeniably the largest deposits belong to the so-called Carboniferous age. It is true of anthracite that the coal-fields of Pennsylvania are the chief source from which it is obtained in large quantities. In Rhode Island and Massachusetts, there is a small anthracite field, formerly supposed to be geologically much older than the Carboniferous, but now, we believe, generally admitted to belong to that age, though the measures lie, in some places at least, directly upon ancient crystalline rocks. In this field, and less clearly in the extensive basins of Pennsylvania, the action of heat in converting bituminous coal into anthracite has been recognized. There is reported to be a single thin bed of semi-anthracite in the coal-field of Arkansas.

More interesting, perhaps, to the geologist, are the local occurrences of anthracite, produced by igneous action upon coal-beds, which in other places are not anthracitic. Thus, in Sonora (according to MACFARLANE'S excellent book on *The Coal Regions of America*) beds of Triassic coal at Los Bronces, have been converted by local [volcanic action into anthracite of fair quality. A similar instance is reported from Queen Charlotte's Island, off British Columbia. But the instance most interesting to us at present, and the one which promises to be soonest important in a commercial way, is the occurrence of anthracite in the Tertiary sand-stones surrounding the San Lazaro or Old Placer mountains, in New Mexico. Probably the coal-measures of this group are the equivalents of those already known on the Arkansas at Cañon City, Colorado, and at Trinidad. The gap of perhaps two hundred miles in an air-line between Trinidad and the Old Placers is partly filled by intermediate discoveries of coal, not directly on the line, such as one near Taos, another in the Raton mountains, near Cimarron, and another on the Purgatoire, near Las Vegas.

But in all these cases, the coal, however excellent its quality, is still lignite. It is, so far as we know, in the locality of the San Lazaro mountains only that it appears as anthracite; and there its character is clearly due to the intrusion and overflow of dykes or masses of porphyry. There are probably at least 30,000 acres of the sandstones within the limits of the grant known as the Ortiz Mine grant, and owned at present by the New Mexico Mining Company. These strata form large sloping *mesas* or table-lands between the mountains and the valleys of the Galisteo and the Tuerto. Coal has been found in the bluffs and sides of the *arroyos* or gulches which traverse these table-lands, in so many localities as to justify the belief that it is everywhere present at small depth from the surface. The great abundance of porphyry on this tract, and the character of the outcrops thus far exposed, lead to the belief that a large part, or even the whole, of the coal-beds within the limits named, will prove to be anthracite. The earlier examinations, by COX, OWEN, LE CONTE, HAYDEN, FRAZER, LESQUEREUX, BRÜCKNER and other experts, led to no decisive result as to the number of coal-beds in these measures. It was, however, our good fortune, during a recent somewhat detailed and prolonged survey of the region, to discover, on our third visit to what is called the Old Anthracite mine, an exposure of the strata, in a neighboring arroyo, hitherto, we believe, unreported. Here we were able to trace four beds of coal, one above the other, and apparently undisturbed, within a section of 100 feet, vertical height. At least three of these appear to be workable, averaging 4½ to 5 ft. of coal each, and separated from each other by the regular series of sandstone and shales. This would give per acre some 30,000 tons of coal, less whatever must be deducted for the area destroyed by the porphyry. Of course, it is not practicable to make accurate estimates upon ground so little developed; but the conclusion is safe enough that the 30,000 acres of coal-sandstones on the tract referred to will be able to furnish a large supply of exceptionally good fuel. It would pay well to haul it thirty miles to Santo Fe, and sell it there for domestic purposes, but for the grasping spirit of the Mexican teamsters, who would rather go to town with empty wagons than take freights at reasonable rates.

But either the Denver and Rio Grande, or the Atchison, Topeka and Santa Fe, or the Atlantic and Pacific railroad will soon be extended into New Mexico. The low divide at the head of the Galisteo is the best pass through the eastern range of the Rocky Mountains, and will undoubtedly be followed by whatever one of these companies is able first to occupy the ground. This route will bring the railroad within five miles of the tract containing the anthracite; and we shall therefore not be surprised to hear of it in the market at no distant day.

It is said that the Trinidad coal, of Southern Colorado, yields a fair coke. The field will be reached this year, we learn, by the Denver and Rio Grande railroad. The coals now accessible to railway communication in Wyoming and Colorado do not appear, so far, to have been successfully used in metallurgical operations. The only apparatus in which they could without doubt be perfectly utilized—the gas-generator—has not yet been introduced in those regions (except in forms too much complicated with patent humbugs to be worthy of serious discussion); and meanwhile, the present outlook for a metallurgical fuel in the Rocky Mountains, for ordinary shaft-furnaces and iron blast-furnaces, is confined, in Colorado, to the Trinidad coke, and, in the country further south, to the anthracite of New Mexico.

On the Copper Deposits of the Blue Ridge.

II.

IN my last letter I gave some account of the Ore Knob Copper Mine, in Ashe County, North Carolina, where I then was. I have since examined the copper deposits of Polk County, Tennessee, and Carroll County, Virginia. The first of these are the well-known Ducktown mines, which were well described in the report of MESSRS. TRIPPEL and CREDNER to the American Bureau of Mines in 1866. In this, as in the earlier published reports of MESSRS. WHITNEY, BLAKE, and others, these deposits of Ducktown are indicated as conforming in dip and strike with the enclosing mica-schists, and not as fissure-lodes. Notwithstanding their apparent intercalation, I am, however, disposed to regard them not as contemporaneous with the strata, but as subsequent deposits in rifts or fissures. This relation of contemporaneous or posterior deposition is evidently the fundamental distinction in mineral deposits; and in the latter case it is but a secondary consideration whether the opening in the strata, in which the endogenous mineral mass has been formed, is transverse or for greater or less distances conformable to the stratification. It is doubtless in some cases difficult to distinguish between the contemporaneous impregnation of a sediment, as in certain foreign copper-slates and some analogous deposits in various crystalline schists, and the penetration by diffusion, which often attends the subsequent deposition of a metallic ore in fissures, since in the cases where these conform to the strata, the local impregnations sometimes give the aspect of a passage from the bedded lode to the adjacent rock. Fine samples of lodes, intercalated for considerable distances with the strata, are seen in the granite veinstones which abound in the gneisses and mica-schists of the Montalban or White Mountain series in some parts of Maine, as described by me in the *American Journal of Science* for March, 1871; and also in the thin parallel veins which, at Winslow, in that State, carry cassiterite and mispickel in a gangue of fluor, quartz and mica, and are intercalated between the beds of a micaceous limestone with great regularity, and only here and there are seen to trasverse the beds, thus revealing their posterior origin. These were described and exhibited by me at the meeting of the Institute of Mining Engineers in February last. In both of these cases, however, the endogenous character and posterior origin of these deposits is evident from their structure and mineral composition, and it is in like manner that, after a careful study of the Ducktown copper deposits, and a comparison of them with others in Virginia and North Carolina, I feel constrained to regard them as having been formed in the midst of the strata, and as apt, in any part of their distribution, to appear as transverse veins. There are, it is true, in their immediate vicinity, impregnations in the mica-schists which simulate closely those of contemporaneous origin, but the great masses of pyritous ores and associated minerals, as disclosed in the deep workings at the East Tennessee mine at Ducktown, have all the characters of true veinstones. The massive pyrrhotine and chalcopyrite which form the metalliferous portions of the deposit are traversed by large crystals of zoisite, hornblende and pyroxene, the latter sometimes an inch in diameter and six inches in length. The hornblende crystals are often curved, and sometimes partially broken across, and their transverse fissures filled with sulphurets, which are also occasionally interposed between the cleavage planes of the augite crystals. These silicates are sometimes incrusted with chalcopyrite, with galena, with blende, and more rarely with crystallized pyrrhotine; molybdenite is also met with. But for these associations it would be impossible to distinguish specimens of these silicates from those met with in the great Laurentian veinstones so well known to mineralogists, and the resemblance to the latter is still more complete in the great masses of coarsely cleavable white augite rock which form portions of the veinstone, and in others which are an aggregate of long prisms of greenish hornblende imbedded in a gangue of white crystalline calcite. With these are associated varieties of finely fibrous hornblende, greenish, brownish and snow-white in color. The disposition of these is more or less regular, and in some cases, at least, parallel to the plane of the lode. In one instance a layer of prisms of white hornblende, two or three inches in length, is arranged in a columnar manner transverse to the wall, the interstices being filled with chalcopyrite. Layers of vitreous translucent quartz, with enclosed masses of sulphids, are also found, having all the aspects of ordinary quartzose veinstones. A pale cinnamon-colored garnet, sometimes in crystals half an inch in diameter, is also met with imbedded in quartz, or more frequently in chalcopyrites. The latter also sometimes includes large and fine crystals of mispickel. A collection of the various minerals and mineral aggregates from the present workings at the East Tennessee mine would, I think, convince the student familiar with veinstones that this great deposit, whatever its attitude in regard to the enclosing rocks, is of posterior formation and identical in the mode of its formation to ordinary concretionary veins. Similar evidences, though less completely displayed, are seen at the Isabella and Mary mines, which are opened on lodes distinct from the East Tennessee mine.

It is worthy of remark that the garnet here met with is identical in color and

in aspect with that found associated with the copper ores of the Ore Knob Mine in Ashe County, North Carolina; and that passing thence into Carroll County, Virginia, the interstratified copper lodes there found, which are apparently identical with those of Ducktown, are often bounded by layers of vitreous quartz, which sometimes forms large crystals, rounded on the angles and incrusted with metallic sulphids. Similar specimens occur in the clearly transverse lode of Ore Knob. In the Carroll County deposits fragments of the mica-schist which forms the enclosing rock are found imbedded in the sulphids of the lode, and the contact of the wall-rock with the layer of quartz is perfectly well defined. It should be said that both here and at Ducktown the country rock, like that at Ore Knob, presents the characters of the White Mountain series. Mica-schists, occasionally with garnet, staurolite and kyanite, predominate, and are associated with a blackish or blue-black hornblendic gneiss, and a fine-grained greyish-white gneiss, which at depths where decomposition has not penetrated, resembles the beautiful granitoid gneisses, so much used in Maine and New Hampshire. A stone of this kind is quarried near Hillsville, in Carroll County.

The great ore deposits of Ducktown are certainly very variable in breadth, ranging from 300 feet to not more than twenty. They are, according to Credner and Trippel, occasionally pinched out in their longitudinal extention, and so succeeded by others as to allow of their being described as lenticular masses, arranged *en échélon*. At the same time the length of these is very considerable; one at Ducktown has been worked continuously for black ore for nearly a mile, and another has been opened for a still greater distance in Carroll County, Va.

The curious phenomenon of the black ores of these deposits has often been described, and there seems no reason to question the received explanation that they owe their origin to a reduction, by some as yet unexplained process, of the sulphates formerly generated by oxydation in the upper portion of the lodes, which, as is well known, is changed into a porous mass of hydrous peroxyd of iron holding more or less oxyds and green carbonate of copper in its lower portions. The analyses by Trippel and others have shown that this black ore is chiefly asulphid, n which iron sometimes predominates, while more generally it contains a large r oportion of copper, and approaches in composition to copper-glance, crystals which species, according to Mr. August Rahr, occur in druses in some varieties of this ore, which, in other cases, approaches more nearly to erubescite or alcopyrite in its composition. Some masses of these ores hold grains of native opper or crystals of red oxyd, while copper-vitriol, as a result of oxydation, often mpregnates these more or less porous or cellular ores; the drainage-waters from which yield considerable quantities of the salt. The product of cement copper obtained at Ducktown by passing the water from certain of the workings over scrap iron is equal to about 5,000 pounds monthly, and the waters hold, in some cases, as much as one part in 1,000 of copper, though generally more dilute.

The study of these deposits in Ducktown and in Virginia has convinced me that the rich purple, gray and black sulphurets of the Ore Knob Mine, described in my last letter, are of secondary origin, though originating in the alteration of a lode of yellow copper ore of phenomenal richness.

These so-called black ores are found in direct contact with the unchanged sulphids of the Ducktown lodes, and it is by an error that the constant existence of a zone of pyrites free from copper has been asserted between the overlying black ores and the productive masses of yellow copper beneath. The fact is that these great pyritous lodes vary in composition in different parts, both laterally and vertically, and it has sometimes happened that a portion comparatively poor in copper has been met with just below the black ores, while, elsewhere as at the Mary Mine in Ducktown, excellent yellow ores are found in that position. The breadth of these deposits is very great; the chief western lode at Ducktown varies from twenty to ninety feet, while the great middle lode, on which the Isabella and Eureka mines are situated, attains more than 300 feet. All portions of these immense lodes not being equally rich in copper, it has been found advantageous for the purpose of exploring them and of determining what parts may be mined with the greatest profit, to make use of the annular diamond-drill which has just been employed at Ducktown with remarkable success. The great 300 foot lode, dipping to the southeast at a high angle, has been traversed by two borings nearly at right angles to the plane of the lode, and the inspection of the ores removed shows the existence of two large bands of workable copper ore interposed in the enormous mass of pyrites, which require only to be opened by a shaft to greatly augment the produce of this region. Some details of the mining and smelting of these ores, together with observations on the future importance of these deposits as sources both of copper and sulphur, and on the not less valuable and more accessible lodes of a similar kind in southwestern Virginia, must be reserved for a third letter.

Boston, July 25, 1873. T. Sterry Hunt.

CORRESPONDENCE.

The Question of Ore Separation.

New York, July 24, 1873.

To the Editor—Sir: I have read with much interest the different communications from Messrs. Engelmann and Baker, on the subject of Wet *versus* Dry Concentration, which have lately appeared in your columns. I quite agree with you, that much can be said on both sides; and I believe that a fair and open discussion on the subject would be of great benefit to Mining Engineers generally. I am myself a staunch advocate of the Wet system, but, at the same time, would by no means deny that Dry Concentration, if perfected, would in many cases, be an inestimable boon to the miner. In your issue of July 22, you mention a dry concentrator, used some years ago at Engis, in Belgium, at the same time expressing the desire to learn more about it, and, therefore, a short description of the apparatus, as used there in 1862, coupled with the result of some experiments I made with a similar machine in Germany during 1866, may be interesting to you. The apparatus consisted of a horizontal wooden box or tube about 0.40 meter square and 8 meters long. The bottom of this tube was formed by a series of funnel-shaped receivers, resembling somewhat a row of ordinary "Spitz-Kasten." These funnels emptied into receivers or bins below, from whence the concentrated ores were eventually taken. One end of the tube was open, while at the other end was placed a small fan blower. A hopper, fed automatically, dropped the ore in a regular stream down in front of the blower, the current from which (being regulated according to the ores to be treated) carried it along the tube in question, the different grades of ore being, *theoretically*, deposited according to their specific gravities at a lesser or greater distance from the fan. The machine in this form was used for some years at Engis, but was, I believe, finally discarded. In 1866, having a very large quantity of slimes to concentrate, and being greatly embarrassed by lack of water I determined to try this wind concentrator, but after experimenting with it for for some time, I became thoroughly convinced that the result of its work could never be relied on.

The stuff to be treated consisted of slimes and fine sand ores, containing: Galena, zinc, blende, copper pyrites, and spathic carbonate of iron, in a gangue of magnesian limestone, which had I been treating on percussion tables and in Dally-tubs. These slimes were carefully classified by revolving screens into three sizes, the largest grains being m0.0005 in diameter, and each class was worked alone after having been thoroughly dried by steam. The result of the working of each size was pretty much alike, and when the machine worked perfectly was about as follows:

The No. 1 Bin nearest fan contained a mixture similar to the original stuff, though with less gangue.

The No. 2 Bin contained nearly pure galena.

The No. 3 Bin contained galena, copper pyrites, spathic iron and blende.

The No. 4 contained copper pyrites, spathic iron, blende and galena.

The No. 5 Bin contained blende, copper pyrites, and spathic iron.

The No. 6 Bin contained blende, nearly pure.

The No. 7 Bin contained blende iron and limestone, copper and silver; the two latter in small quantities.

The No. 8 Bin contained limestone, blende and copper.

What was carried out at the end of the tube consisted of very lean tailings.

The proportion of the different ores in the bins as above was in the ratio as their names are written.

These results are really more theoretical than practical, as no single day's working ever gave the same proportion. The amount of ore that is put through the machine in a day of twelve hours varied from twenty-five to twenty-seven tons. One great cause of failure I found to be, that it was almost impossible to maintain a regular current of air from the fan; the *slightest* variations in the speed of the engine, even those caused by throwing a single jig in or out of gear, were sufficient to entirely marr the results. In order to counterbalance this, I ran the driving-belt over a conical drum, which was placed in communication with the governor of the engine, but even that failed to give us uniform work, so I was obliged to fall back again on the old water system. I do not know whether the dry concentrator at present at work at Engis is the same as the one I saw there in 1862, but I should think probably it was some improvement on the same system. The ores of the "Nouvelle Montagne" Company's mine, consisting merely of galena, blende, and sulphurets of iron in a gangue of light carbonate of lime, could under some circumstances be advantageously treated even by the original machine.

It would take up too much of your valuable space to attempt, in one letter, to thoroughly discuss the merits or demerits of the two systems of ore dressing; but in a future number, I will endeavor to do justice to both sides.

E. Gybbon Spilsbury, C. E. and M. E.

187 Broadway, New York.

Horizontal vs. Beam Engines for Mines.

At a late meeting of the South Midland Engineers, a paper was read on Colliery Winding Engines, which, as well as the discussion which followed, showed that horizontal engines are the favorites with the members. The author, Mr. Watkins, adverting to a request made by the Institute, said that, as he had expected, he had experienced great difficulty in getting statistics showing the durability of horizontal and beam engines respectively. Everything depended on the make of the engine, the getting up, and so forth. But the tendency to wear the cylinders oval in horizontal engines was unappreciable, especially where the piston rod was carried through the stuffing box at the back; a method which he should recommend in all engines beyond those of 12 pound and 14 pound pressure. A further advantage of the horizontal over the beam or direct acting engine, was the ease with which in horizontal engines the pistons could be got out. The whole machinery being upon the ground, the back could be reached and the pistons slid out on the cylinders. The President inquired upon what portion of the machinery the engineers would place the brake power required by the act of Parliament? Mr. Watkins recommended that it should be placed upon the winding drum where there was second motion, and that the brake in that place should be supplemented by one upon the gear wheel also. The President explained that he put the question because the same interrogatory had been made by the mines' inspector of his district

(Shropshire) to all the mining engineers, who had just come up for examination. They had all expressed the same views as those which Mr. WILLIAMS had now enumerated. Inasmuch, therefore, as the mining engineers were supposed o have control over the mechanical arrangements, their reply would necessitate the application of brakes to drums, with a supplementary brake upon gear wheels, where they had not as yet been applied. And, he might state, that throughout his district these arrangements were being carried out. Mr. GLENNIE thought that it was usual for the inspectors themselves to point out where they wished the brake to be placed. The Secretary showed that the requirements of the act of Parliament was an "adequate" brake. This left it with the mining engineers to determine where they should put the brake. A brake upon the fly-wheel of an engine having second motion would not be an adequate brake.

With this view the Institute concurred, and Mr. FENN pointed out that almost all the colliery winding engineers in North Staffordshire had, in addition to the brake upon the drum, one also upon the fly-wheel, which could be worked by the foot of the engineer as he stood at the gearing. Mr. THOMAS CLARIDGE, one of the projectors of the Phœnix Works, strongly advocated horizontal in preference to beam engines, and said that he would rather lay down horizontal than beam engines, and do it at from 15 to 20 per cent. less cost. He preferred for the foundation concrete and bricks and mortar, rather than stone, and said that enquiries he had just made throughout Lancashire led to the conclusion that first-class collieries were all adopting the horizontal shape. The speaker, taking up the question of alleged greater wear of the cylinders in horizontal engines, showed, as the result of his own careful enquiry that the wear was due to the extent of the angular action of the connecting rod on the piston head. Mr. PATLOW and others, joined in the discussion; and Mr. GLENNIE and Mr. B. P. WALKER supplied data upon the result of rapid motions. Mr. WALKER adduced an instance of shafting that was kept in rapid motion at his works more admirably and showed less signs of decay than shafting run at a slow pace in other instances of which he had knowledge. Mr. CLARIDGE, again quoting the result of his enquiries in the past few days throughout the great ironworks in Lancashire and the North of England, brought forward illustrations of the enormous cost at which rapid speeds were being there maintained. Mr. CLARIDGE submitted that the cost was altogether disproportionate to the little advantage which it secured.

Safety on Railroads.

At the meeting of the Railway Association of America the committee on the safe despatching of trains made a report in favor of the "block system." They said:

"The objection is urged by some that the power of moving trains is placed in two many hands, and that responsibility i placed in too many localities. This feature is the strong point of the system. In it the whole essence of safety lies. If one makes a mistake he is certain to be corrected by one of the others. The responsibility is, it is true, placed in many localities, but not weakened: instead of one being held responsible, two are, and instead of two, three are, and so on; but the responsibility is not weakened. It falls with full force on each one connected with moving the trains, each one being directly responsible in his own sphere.

"The weak point of the American system is that important movements are intrusted to the hands of single individuals, or to two persons similarly circumstanced (for example, conductor and engineman), so that if they blunder, the error goes on to result without chance of detection. The objection that there would be continual quarrelling for circuit is raised by those who forget that the circuit would have to be from station to station. Very rarely indeed, if ever, would atmospheric disturbances prevent stations from communicating with each other. If, however, such interruption were to happen, trains would be in no worse plight than under the existing systems: they would have to fall back on time-card rules. Difficulty might at first be experienced from the quarrelling of stations, each station being, of course, anxious to send its train off first, so as to clear its sidings; but a little discipline and a definition of the rights of trains would put a stop to such annoyances. All these difficulties were, no doubt, encountered when the system was put first into operatian on the Southeastern (Eng.), but as more than 750,000 trains have been moved without accident, it is but fair to presume that the obstacles were overcome, and that as 700 trains is the daily average, the system has not proved cumbersome, nor has it caused much delay. It is true the Southeastern is a double track road, but the India roads are single track, and have worked for many years without collisions. Its introduction in this country must be a mere question of expense, not of efficiency or desirability, and that question must be settled by the railroad companies individually. The system is, so to speak, elastic; that is, it may be made to suit different degrees of traffic, principally by regulating the distances between telegraph stations.

"Where the trains run close together, the telegraph stations must be close together; where the trains are few, the telegraph stations may be far apart. For instance, the system can be worked perfectly where every *second* stopping place is a telegraph office, in which case trains, when necessary, can be given orders to meet and pass at the intermediate station *or* siding. This system must not be confounded with the "block" system that has been abandoned on some English lines, and was partly condemned by Capt. Tyler. The Massachusetts Commissioners apparently fell into this error, for in their third report, page 140, they say: 'The Southeastern and the London, Chatham & Dover, for instance, operating 466 miles, worked throughout on the telegraph block system, met with no train accident in 1870, while the London & Northwestern, worked for a small portion only of its 1,427 miles on a block, had no less than 34 train accidents which required investigation during the same year.' The Southeastern and the London, Chatham & Dover are the only roads in England worked under the plan described by Mr. Watkins, which he calls the *absolute* block system, while the London & Northwestern is operated under what he calls the *permissive* block system—neither one thing nor the other.' The *absolute* block system provides for a repetition of messages between the two stations regarding each train, and that the train shall not pass until those messages are complete, and on a double track not until the interval is clear, so that, if one operator is negligent, delay will result to the train, which is certain to bring the party in fault prominently forward. Again, if one of the operators make a mistake regarding the train, there is almost a certainty of its being rectified immediately; that is, as great a certainty as is possible where human agents are employed. A great advantage is that the train orders and messages are uniform; in transmitting them over the wire they can be expressed in formulæ or signs, all except the number and description of the train, so that the actual transmission of messages occupies but a short time, and there is no chance of misunderstanding. It is not necessary for trains to stop more frequently than under the American system, the permission to pass being given by signals. The system does not, as some have supposed, supersede the time-table, although it might render trainmen less careful to keep on time, from the greater sense of security when off time, but that is a matter easily regulated by the superintending officers."

On the Origin of Clay-Ironstone.

AT a meeting of one of the British Geological Societies, Mr. J. LUCAS, F.G.S., read a paper on this subject. The author commenced by giving a general view of the varieties, chemical composition, and mode of occurrence of Clay-ironstone, and suggested that the formation of all the bedded varieties may be explained by the supposition that they originated in peaty or non-peaty lagoons on the alluvial flats of the deltas of the Carboniferous formations, which would present semiterrestrial conditions, that is to say, a surface exposed to the air, but subject to be covered by floods. Carbonic acid formed in the lagoons from decomposing vegetable matter, meeting with protoxide of iron in solution, would unite with it to form carbonate of iron, which, with the mud of the lagoon, would produce clay ironstone. Thus, in the author's opinion, the beds of clay ironstone, like coal beds, mark terrestrial horizons. The author supported his views by reference to various sections, and also cited the occurrence of what he regarded as an analogous phenomenon on a small scale, in some mud obtained from the shore between Redcar and Saltburn.

Professor ANSTED thought that the explanation offered by the author, though satisfactory for instances of limited thickness and confined area, was not equally applicable to the far larger deposits, such as those in America, extending over hundreds of square miles, and many times as thick as those described. The beds had by some been considered as due to segregation subsequently to their deposit: but this view also seemed hardly such as could be generally accepted. The deposits of ironstone varied much in character, sometimes consisting of layers of distinct nodules, and in some cases of continuous bands. The origin of each of these classes appeared to him to have been different, and in some of the coal deposits the ironstone bands were present on a more extended scale than seemed consistent with the author's theory.

Professor RAMSAY thought that the paper exhibited considerable ingenuity, and that the examples given by the author were intended by him to be equally applicable to large areas. The estuarine character of much of the coal deposits was an acknowledged fact; and the theory proposed by the author was quite in accordance with such a state of things. He did not agree with him that ironstone was never deposited in marine strata, as they occurred in the Yoredale beds and in some Liassic beds. As to the deposits of ironstone in fresh water, he referred to those still taking place in some of the Swedish lakes.

Mr. FORBES, while admitting that in many instances clay-ironstones had been deposited in circumscribed waters or shallow lakes, as is the case with the lake iron ores in Sweden now actually in process of formation, pointed out that some of the largest clay-ironstone deposits in England, those of the Yoredale series, contained marine fossils in abundance. On chemical grounds, it is not clear in what state of combination the author imagines the iron to be held in solution previous to having been, according to him, converted into carbonate of iron, by meeting with the carbonic acid formed in the lagoons from decomposing vegetable matter; and further, the mere fact that the Saltburn mud effervesced with nitric acid after having been bottled for some days, must not be regarded as necessarily proving the formation of carbonate of iron in it.

Mr. CHARLESWORTH called attention to the nodules of ironstone which were found in the coprolite diggings in Suffolk, as to the origin of which little was known. The banding in the interior of these nodules was posterior to their formation, as was evinced by its following the contours of the exterior, and even of lithodomous borings in them.

MINING SUMMARY.

Colorado.

From the Georgetown *Miner* of July 24.

THE DOUGLAS SILVER MINE

Is situated in Clear Creek Valley, about two and a half miles below Georgetown, on Douglas mountain. It is being operated as a tunnel company, of whom MATHIAS GOETZEL, Esq., is president, and now here attending to its affairs.

In a mineralogical point of view it presents peculiarities of an interesting character which are worthy of notice by the mining community of the district. The lodes the tunnel is intended to intersect, are "counters," viz, they have a northwesterly course, while the generality, in these mountains, run northeasterly making the difference of strike about 108 degrees. The geological formation is schistoze, but having quartzite and concretionary granites as the predominating rock; the gneissoid, although interstratified with, and in places interspersed through, the more silecious masses, is not strongly represented; at least, on this southeastern slope of the mountain.

The tunnel is driven in 385 feet, and is within thirty feet of the first lode, of which there are seven laid down on the map of the property, this being the first example of its kind that has come under my observation in this part of the valley. I made a somewhat close examination of the geological structure around this No. 1 lode; if there is, or ever has been, any metallic minerals in the super-bounding rocks, they must, when "soluble," by the natural law of gravitation, become precipitated in this first lode; for the normal bed planes, as well as the cleavage planes, dip into it from the north; the next thing to which I would especially direct attention is, the bed joints on the south form synclinals with those of the north, making the line of the

lode an inverted apex, and thus become a receptacle or reservoir for the infiltrating mineralized waters on both sides. Now, the conclusions practical mining engineers would come to on the examination of such a structure would be: That if there are no cross lodes, slides, dislocations or throws in the stratum, to heave or divert the course of the lode, which is evidently a diagonal fissure lode, and it holds down steadily its present inclination, it must become very productive in mineral in depth. This is my opinion.

The lode is from three to five feet wide; dips at an angle of seventy degrees to the north; the matrix is a slightly granular quartz and feldspar, but in some places compact and hard; the leading vein is composed of mineralized argillacious matter, quite soft, averaging eight inches thick; the minerals are; Silver, lead, zinc blende, sulphuret of iron, with traces of antimony and coloring of carbonate of copper and manganate of iron; at the surface it carries from three-quarters to one and a half tons of good ore to the lineal fathom of ground. There is somewhere, not far from this lode, a vein of "yellow-green" porphyry. I have found several loose stones of it on the surface, and a few above the ordinary line of the valley drift, and in the detritus of the mountain slope. Now this vein or dyke should be traced up, for, if it comes in contact with the lodes they will be very productive in silver at and along the point of junction. This has been invariably the case in all parts of Colorado where I have made geological examinations.

Utah.

TINTIC DISTRICT.

From the Salt Lake *Herald* of July 19:

JOE BOWERS LEDGE.

Although the Wendigo company, through their superintendent, Mr. JAMESS W. WAYNE, state that they will resume work soon, and purpose erecting a mill introducing the Paul process, Mr. WAYNE informs me he will visit Springville this week to learn particulars, and get estimates of the cost of a 10-stamp mill. Along the Bowers ledge there is now something like fifty tons of apparently good milling ore. Messrs. TOSTWIN, JEFFRIES & Co., of Council Bluffs, Iowa, own six hundred feet north of the Wendigo company's property on this ledge. Mr. TOSTWIN shipped about four tons of their ore, which averaged from samples eighty-three dollors per ton, and is a free milling ore. The following assays have been made from their ore, from picked samples, $592.62, $1210, $442, a sample of thirty pounds $157.14, while about thirty specimens average forty-six dollars, which may be said to represent the ore now along the ledge upon the various dumps.

THE SHOEBRIDGE.

Has recently shown its real worth. Since the Shoebridge Silver Mining Company have purchased it, they have performed a large amount of work. The shaft, nearly 250 feet deep, was very small and unsuited to their wants. The company are now busy enlarging and straightening the same, and putting into position their steam hoisting works. For this purpose they are employing from ten to fifteen hands, and will soon be in condition to raise large quantities of ore which I believe they have upon their property. Various persons and companies have expended both time and money upon this claim with varied results. I believe the work has been done without special reference to economy or convenience for working the mine, leaving it in an unsatisfactory condition for sale. However this may be, the present owners appreciate the situation, and having ample means and employing skillful men to oversee their interests, are quite sure of gratifying results. The ore from this mine has been reported the basest and most difficult to treat of any in Tintic; and yet they believe by the Aiken process they will be able to work it quite satisfactorily. It is high grade, specimens showing from ninety to one thousand ounces of silver. I was informed that the result of a thorough sampling of the mine showed an average of one hundred and twenty-four dollars. Much has been said about this mine through the columns of your city papers, therefore further than to state its present appearance, I will not occupy your space. No mine could be more favorably situated. Their ore can be loaded into wagons at the dump and hauled directly to their mill, of which I may make mention further along in this communication. The Shoebridge is situated about one mile north of Diamond.

THE MORNING GLORY,

Owned by ten or fifteen persons, mostly residents here, is one of the old claims of the district, embraces three thousand feet in its location and has been worked more or less during the last three years. Upon the summit of the ridge near the north end of the mine, a shaft has been sunk about one hundred feet, from which they have taken a large quantity of copper ore, and quartzite, very highly stained. Mr. BROOKS, one of the owners of the property, informs me that samples taken from this shaft have shown 46 per cent. of copper, and a small quantity of silver. If I was called on to decide if this shaft was upon the same ledge as the one fourteen hundred feet further south, I might be compelled to tunnel the whole way. At their lower shaft, which is about one-third of a mile north-westerly from Diamond, upon the low hills, they have performed a large amount of work, and have taken out considerable ore that runs very fairly in copper and silver, and seems to increase in value as they sink, silver taking the place of copper. Recently they have struck a pocket of fine ore, assaying over two hundred dollars. The vein is well-defined in porphyry and quartzite, and seems to bear six degrees east of north, and west of south, which may be taken as the general course of all ledges in this end of Tintic district. While it is not a large vein it has been looked upon as reliable, and if owned by one person or a company having means to open it, would command a good price. At present two or three are doing all that is done. They have taken a few tons of their ore to Miller's mill, to have it thoroughly tested, with a view of ascertaining its value at the mine.

THE NORWEGIAN

Mine is situated up and down the southerly slope of Chloride Hill, about one and a-third miles northwestly from Diamond. It is the oldest location upon the hill, and was made like the Sunbeam, when Tintic was new, and the cost of recording claims considerably above the prices established by the present law. Like the Morning Glory, the Norwegian embraced three thousand feet, reaching from the summit of the hill to the valley below. Some irregularities are said to have occurred concerning this location. It has been re-located once or twice, whether lawfully or not of course remains for the legal fraternity to fairly test, and no doubt they will have a chance. The mine, however, has real merit, and as a mine we hope to be able to present it. At the discovery stake, a shaft over seventy-five feet deep has been sunk, cutting down the west side of the ore which is very highly stained with copper. One of the present owners informed me that he had taken some of the same from the dump and had it assayed, with very flattering results. The body of ore in this shaft is about seven feet wide. At a number of cuts upon this ledge, higher up the hill the vein shows from three to five feet of ore. These surface ores, however, do not seem to contain very much silver. Still the ledge which is very large holds its course so clearly towards the centre of the hill, and seems so highly mineralized in its entire length, that there seems scarcely a doubt that it will prove a valuable property. At present no work is being performed here, the owners claiming that they cannot afford to haul ore of this character to your city. With the completion of copper reducing works here, they will be able to make the product of this mine very profitable. They are men who are not afraid of work, and I believe will be well rewarded therefor.

THE VICTOR

Is a claim located north of the Norwegian, upon the same hill-side, and like its location, runs up the summit, and unfortunately has a history—about which we will not trouble your readers. A tunnel has been run upon this claim nearly two hundred feet, parallel with the vein. The face of the tunnel shows about thirty inches of ore—of what value I am unable to state. I had two specimens assayed some months since, which showed twenty and forty-six dollars in silver. They claim the present product to be worth sixty dollars. The general course of this claim is the same as the Norwegian. It may be a distinguished ledge—of this I have nothing to say, further than that it might be desirable for its owners and those of the Norwegian to maintain friendly relations.

The first mine upon this hill however, in our humble opinion, is the

JULIAN LANE,

Situated on the summit of the same (Chloride) hill. It is composed of twelve hundred feet—running eight hundred southerly and four hundred northerly from their discovery shaft. The owners have sunk a shaft nearly two hundred feet; almost all the way they have a fine body of milling ore. Mr. BELL, who represented a Chicago company last year, in your city, purchased quite a quantity of it, the value of which was fixed from sample assays made by MCVICKER. The owners leased BENSON'S arastra, at East Canyon last fall, and worked a quantity of their ore. And this summer they have sold a considerable quantity to the Wyoming mill, at Homanville, in this district. Something near two hundred feet north of their main shaft they have sunk another, about twenty-five feet, which shows a splendid body of fine milling ore. Still further down the hill on the north side, the owners of the Julian Lane have commenced a tunnel, through which they purpose working their mine. This will penetrate the hill nearly four hundred feet below the summit. Fine specimens of this ore have been sent to the prominent museums and institutions throughout the country, and have received general praise for their intrinsic value as well as appearance.

THE GOLD HILL

Is situated upon the northeast side of the same hill. It is composed of twelve hundred feet, and is claimed by its owners as a cross ledge, running easterly and westerly. However this may be, it is a remarkable deposit of ore. Their shaft is nearly sixty feet deep. The ore at the top is fully six feet wide, steadily increasing. At the bottom, a cut thirteen feet long has been run southerly, showing ore all the way, with more ore in front. The ore has been taken out here, leaving a chamber nearly twenty feet long and ten wide entirely in ore. What amount still remains around the chamber, I can form no idea. It certainly looks very flattering, promising handsome returns to its owners. They have sold considerable of it to the Wyoming mill, and recently they have sold their second grade to an other company, who are now testing its value as free milling ore. It is a very promising mine, and will find purchasers at a fair price during the summer.

THE MAY FLOWER

Mine, below the Gold Hill is considered a distinct ledge. This perplexing question of three, four and five ledges, running along so nearly together is entirely beyond our comprehension, still it may be so. Yet the product of the Victor, Julian Lane Gold Hill and May Flower mines, exhibit some striking similarities. The May Flower has a remarkably fine wall and promises to develop into a fine mine, and if a distant ledge from the Gold Hill and Golden Treasure, will yield handsome returns to its owners.

THE GOLDEN TREASURE.

Is the lowest claim on what seems to me to be the great mineral belt cutting through the above-named hill. It is an older location than some of those previously described. The owners have run a tunnel nearly one hundred feet, showing in places considerable ore, some of which looks very fine. This is an old location, and is considered very valuable.

Reviewing the situation of the six locations named in this and my former letter, it seems to me, that if it was possible for some company, possessed of plenty of means, to consolidate all these interests into one, a mint of money could be made. I know nothing in this district of equal extent that can compare with them for general average value.

THE SIDNEY LODE,

On Dragon Hollow, about one and a fourth miles from Silver City, is one of the largest and most promising mines in Tintic. Since it came under Mr. MEADER'S control he has prospected it skillfully and with apparent success. The cut above the tunnel discloses a ledge of spar ore, quite twenty feet wide. Of its average value I have no definite knowledge, as the workmen engaged there were not informed upon the subject. An assay from a specimen, made by Mr. JENNINGS, at the Tintic Mill and Mining Company's office, showed over eleven hundred dollars in gold. I have heard of much higher results from the same property. It seems a very valuable mine, giving employment to a score of men. The ore is worked at the Wyoming mill.

THE TINTIC MILL

And Mining Company's mill, situated at Farmers' Rancho, is so far completed that two weeks since they started up and crushed their first ore. Their machinery worked very finely, and the product was most gratifying. The amalgam looked as fine as any I ever saw. They are using ore from the Gold Hill, which is said to be as free from base bullion as any in Tintic. The mill has ten stamps of about 600 pounds weight and about ninety drops per minute. It is a plain mill, thoroughly constructed, under the management of Mr. PATCHIN, and employs about twenty men. Mr. MILLER expressed himself very much encouraged by the success attained in his first work. Until they get in place another amalgamating pan and finishing pan, they cannot run to their full capacity, consequently they are unable to accomplish all they desire; but this one thing seems settled, they produce as fine an amalgam as can be found. They are now testing the question of what per cent. of the assay value of the ore can be extracted.

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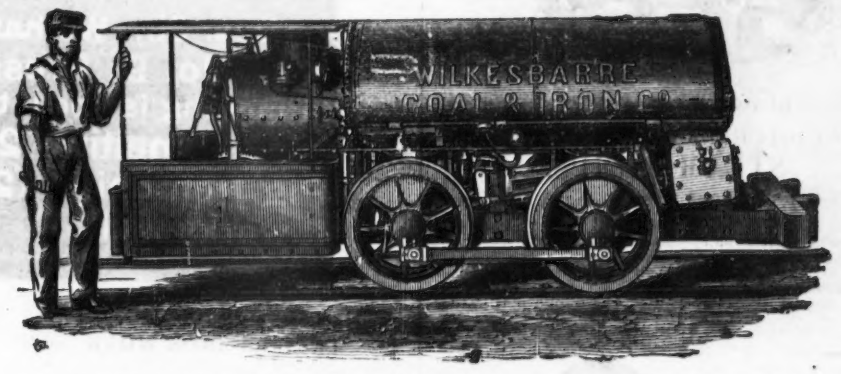

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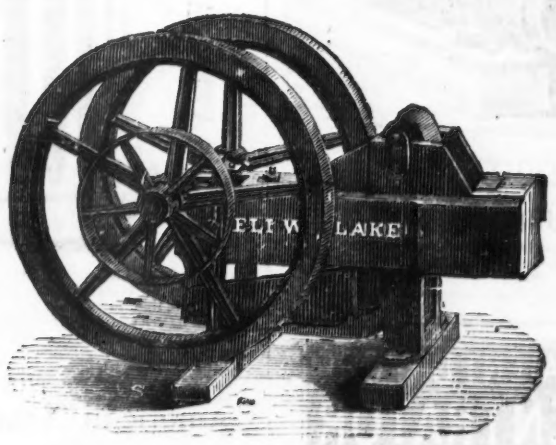

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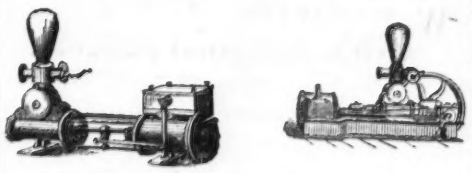

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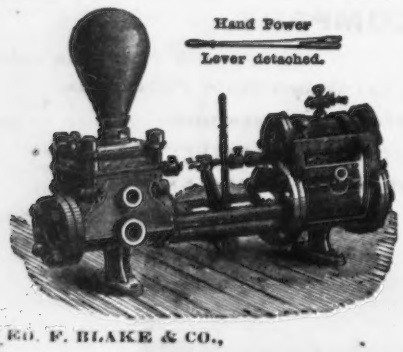

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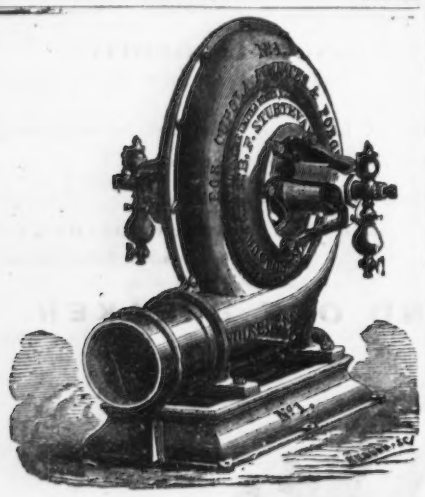

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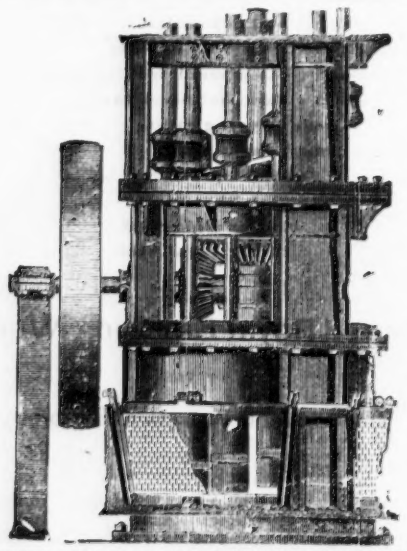

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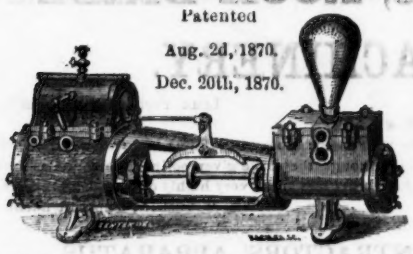

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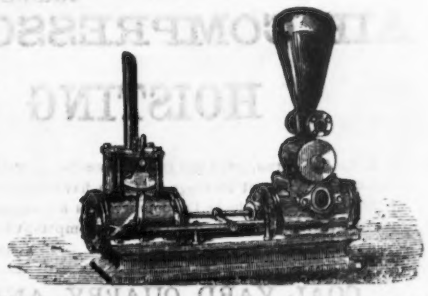

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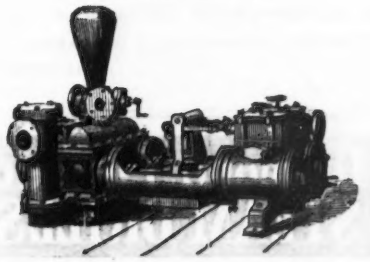

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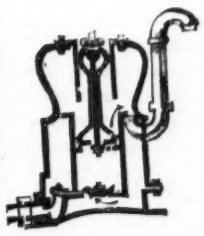

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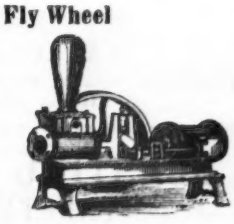

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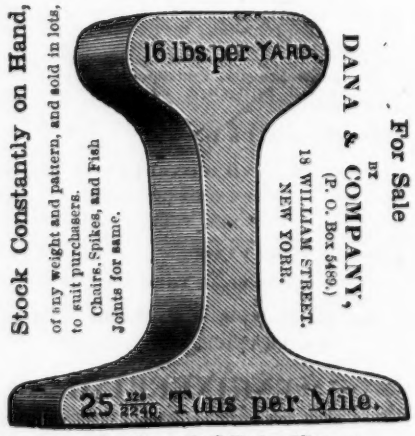
June 24-3m

RAILROAD IRON FOR MINES.



Stock Constantly on Hand, of any weight and pattern, and sold in lots, to suit purchasers. Chairs, Spikes, and Fish Joints for same.

For Sale by DANA & COMPANY, (P. O. Box 5489.) 19 WILLIAM STREET, NEW YORK.

Light Locomotives for use in Collieries, Mines, etc.
march 5 1y